

# Criterion – 3

Research, Innovations and Extension

NAAC- SSR (2<sup>nd</sup> Cycle)



## ETERNAL UNIVERSITY

BARU SAHIB, SIRMOUR-173101  
HIMACHAL PRADESH

**3.1.1(7)**

# **Program and Course Outcomes**



**ETERNAL UNIVERSITY**

BARU SAHIB, SIRMOUR-173101  
HIMACHAL PRADESH

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**DEPARTMENT OF MANAGEMENT**  
**BACHELOR OF BUSINESS ADMINISTRATION (BBA)**

**TITLE:**

The degree shall be titled as Bachelor of Business Administration (BBA) under the Faculty of Management in the Akal College of Economics, Commerce & Management.

**DURATION:**

The course shall be a full-time course and the duration of the course shall be of three years.

**ELIGIBILITY:**

Any candidate having passed the Intermediate (10+2) Examination in any discipline, from a recognized Examination Board with 50% marks (45% marks for Scheduled Caste/ Schedule Tribe candidates) shall be eligible to apply for the course. The other terms and conditions shall be applicable as per university norms.

**PROGRAMME OBJECTIVES:**

1. To provide adequate basic understanding about management education among the students.
2. To prepare students to explore opportunities in the management profession.
3. To train the students in communication skills effectively.
4. To develop appropriate skills in the students so as to make them competent and provide themselves self-employment.

**PROGRAMME OUTCOMES:**

1. It will nurture socially conscious business professionals with entrepreneurial and management insights.
2. Encourage student's creativity and innovative thinking leading to unique solutions for complex problems.
3. Students will learn a sound theoretical base and get exposure to current business challenges.
4. Students will develop capabilities and skills in areas of finance, HR and Marketing to take up initial level management roles in industry.
5. Students will be able to take up higher education in the field of business management.
6. Development of ethical managers with inter disciplinary knowledge.

## **B.Com. (Hons)**

An extensive and demanding foundation for learning, application, research, entrepreneurship, and holistic growth is offered by the B. Com. (Hons.) program. The B. Com. (Hons.) program's overarching goal is to:

- i) fostering a warm and inviting environment in which all pertinent knowledge is imparted;
- ii) broadening the scope and depth of the course to allow students to pursue further studies in commerce and related fields across multiple disciplines concerned with commerce;
- iii) introducing students to current market practices;
- iv) encouraging the students to develop a range of general skills useful in employment, internships, and social activities;
- v) formulating business problems and coming up with creative solutions to prepare them to become future-ready management leaders who are effective and caring.

### **PROGRAMME OUTCOMES (POs)**

After completing a term of study, students apply the knowledge they have gained to achieve the objectives and qualities specified in qualification descriptors. A "programme" is the whole course of study that students do to earn a qualification. In addition to general skills that students must demonstrate to earn a bachelor's degree, the learning outcomes for the B. Com. (Hons.) Programme includes a variety of subject-specific skills, like creativity, mind management, and innovation of competencies in various areas of commerce and business. The study objectives of the B. Com. (Hons.) programme also assist students in preparing for graduate school, the workforce, and responsible citizenship. Additionally, the variation in programme outreach performance levels allows for the comparison of standards and learning levels among other colleges and institutions.

The B. Com. (Hons.) program's study objectives also help students get ready for graduate school, the workforce, and responsible citizenship.

**The various learning outcomes of the programme are mentioned below:**



### PROGRAMME OUTCOMES (POs)

<b>PO-1</b>	Bachelor's Degree in Commerce yields extensive knowledge in the areas of investment, insurance, banking, marketing, human resource management, business and corporate law, economics, finance, accounting, management, and taxation. As a result, this curriculum assists students in laying a solid foundation for their further studies in commerce and in meeting the demands of the banking, insurance, and business sectors, which are looking for young people who are employable.
<b>PO-2</b>	There are many career options available to B.Com. (Hons.) Programme students, and if they play to their strengths, there will always be interesting profiles to work at.
<b>PO-3</b>	After completing this degree, students will also be able to articulate company challenges and offer creative solutions, shaping them into future visionaries and management leaders who are both efficient and compassionate.
<b>PO-4</b>	Since commerce is an interdisciplinary field in and of itself, great care has been taken to incorporate courses that address a wide range of topics, including information and communication technologies, accounting, management, finance, taxation, law, marketing, human resources, statistics, economics, and entrepreneurship.
<b>PO-5</b>	B. Com. (with Honors) Graduates have the choice to pursue the well-trod paths of CA, CS, CMA, and other related fields of study. Depending on their degree path and preferences, they can also select an unconventional career path, such as one in media, telecommunications, travel and hospitality, or another related industry.
<b>PO-6</b>	After completing this curriculum, students will be ready for both the general and the specific workforce in the future. The student will gain personal experience working in the real world. Students will graduate from this curriculum with a greater variety of abilities, such as managerial comprehension and tactical agility. They are also urged to search for audacious, innovative answers to contemporary business issues.
<b>PO-7</b>	This course provides an exceptionally demanding and rigorous foundation for teaching, research, and associated business administration. A significant portion of the elective courses in the framework fall under the Discipline Specific Elective Courses (DSEs), Generic Elective (GE), and Skill Enhancement Courses (SECs) categories.

### PROGRAMME SPECIFIC OUTCOMES (PSOs)

<b>PSO-1</b>	In addition to auditing and marketing, students will study a wide range of business, accounting, economics, and financial topics. With the help of this knowledge, students will be able to make wise decisions and have additional soft skills in addition to their knowledge.
<b>PSO-2</b>	Students assist others in developing their soft skills—interpersonal, communication, and interpersonal—so they may interact more productively and positively.
<b>PSO-3</b>	Gain expertise in IT for business processes and examine how accounting and commerce principles can be applied to resolve challenging business issues.



<b>PSO-4</b>	Equip with entrepreneurial abilities to either develop your own business idea from inception to reality or learn how to manage a creative business in the contemporary business environment.
<b>PSO-5</b>	A B. Com. (Hons.) attests to tenacity, determination, intelligence, and the ability to function well under pressure—qualities that hiring managers and directors seek in their candidates.
<b>PSO-6</b>	An individual will be eligible for advancement prospects inside his or her company if they have shown success in a long-term scenario requiring endurance, self-control, leadership, and interpersonal skills.
<b>PSO-7</b>	Depending on their qualifications and interests, B. Com. (Hons.) graduates can choose from a wide range of job profiles after completing the course, including accountant, auditor, consultant, company secretary, business analyst, finance officer, sales analyst, junior analyst, tax accountant, stock broker, economist, business development trainee, and so on.

#### **FINANCIAL ACCOUNTING (BC 101)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>1</b>	<b>0</b>

**Course Objective:** The objective of this paper is to help students to acquire conceptual knowledge of financial accounting and to impart skills for recording various kinds of business transactions.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand the theoretical framework of accounting and to prepare financial statements.

CO2: Explain and determine depreciation and value of inventory.

CO3: Learn accounting for hire purchase transactions, Inland branches and Consignment accounts.

CO4: Understand the concepts of partnership firm and prepare accounts for dissolution of a partnership firm.

CO5: Develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting.

#### **BUSINESS REGULATORY FRAMEWORK (BC 102)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>1</b>	<b>0</b>

**Course Objective:** The main aim of this course is to impart basic knowledge of important business legislation along with relevant case law.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand basic aspects of contracts for making the agreements, and contracts and subsequently enter valid business propositions.

CO2: Be able to recognize and differentiate the special contracts and identify their appropriate usage in varied business scenarios.

CO3: Equip the students about the legitimate rights and obligations under The Sale of Goods Act.

CO4: Enable with skills to initiate entrepreneurial ventures as LLP.

CO5: Understand the fundamentals of internet-based activities under The Information and Technology Act.

**BUSINESS ORGANIZATION AND MANAGEMENT (BC 103)**

L	T	P
4	0	0

**Course Objective:** To throw light on the basic processes of Management and to provide fundamental knowledge about business management & organization.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1: Learn business activities to compete in competitive world.
- CO2: Understand entrepreneurship from local to international perspective.
- CO3: Evaluate the application of functional areas of business activity.
- CO4: Analyze decision making and communication.
- CO5: Evaluate the impact of legal, social, and economic environment on business.

**FUNDAMENTALS OF MANAGEMENT (BBAOE 101)**

L	T	P
3	0	0

**Course Objective:** To provide students with a comprehensive understanding of the essential principles, concepts, and skills related to effective management in organizations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the nature of management and describe the functions of management.
- CO2. To understand the role of Planning and why important to run organizations.
- CO3. Interpret various organizational structures and how they work efficiently and effectively.
- CO4. Analyze and compare the properties of varied organizational structures to best coordinate and motivate people at work.
- CO5. Identify four functions of management and know how to make decisions in each of these functions efficiently and effectively.

**FUNDAMENTALS OF ECONMICS (ECONOE 101)**

L	T	P
3	0	0

**Course Objective:** To familiarize students with the basic concepts of micro and macroeconomics.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To develop students' critical thinking and analytical abilities around concepts of economics.
- CO2. Understand how demand and supply interact in various market structures to determine the price and quantity of a good produced.
- CO3. Evaluate the factors, such as production and costs affecting firms' behaviour.
- CO4. To make students understand how and why markets work and how prices are determined.
- CO5. To understand the concept of macroeconomics and microeconomics.



**COMPREHENSION AND COMMUNICATION SKILLS IN ENGLISH (ENG 111)**

L	T	P
3	0	0

**Course Objective:** The course aims to understand the basic concepts of comprehension, and fundamentals of grammar, enhance their vocabulary, and improve their skills in written communication.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Discuss the prime necessities of listening skills for improving pronunciation for academic and non-academic purposes.

CO2. The critical aspect of speaking and reading for interpreting the in-depth meaning of the sentences.

CO3. Express about the necessity of stressed and unstressed syllables in a word with appropriate length and clarity.

CO4. Explain how writing skills fulfill the academic and non-academic requirements of various written communicative functions.

CO5. Generalize appropriate concepts and methods from a variety of disciplines to solve problems effectively and creatively.

**FUNCTIONAL ENGLISH (ENG 117)**

L	T	P
3	0	0

**Course Objective:** The course aims to equip students with the necessary language proficiency, vocabulary, and communication strategies to function confidently and fluently in English-speaking environments.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Students will develop reading skills and reading speed

CO2. Understand the functioning of the English sound system.

CO3. Understand language rules, structure and usage.

CO4. Students will increase their reading speed and comprehension of academic articles.

CO5. Students will improve their speaking ability in English both in terms of fluency and comprehensibility.

### DIGITAL MARKETING (BBASE 101)

L	T	P
2	0	0

**Course Objective:** To provide students with a comprehensive understanding of digital marketing strategies, tools and techniques.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Identify and assess the impact of digital technology in transforming the business environment and also the customer journey.

CO2. Describe the functioning of the digital marketers and how it is different than the traditional marketing practices.

CO3. Explain the significance of digital marketing tools, such as, SEO, Social media platforms, online advertising, Blogging etc.

CO4. Gather knowledge about the ethical considerations and the regulatory framework of digital marketing in India.

CO5. Understand the Emerging Trends in Digital Marketing and artificial intelligence in marketing.

### OFFICE MANAGEMENT (BBASE 102)

L	T	P
2	0	0

**Course Objective:** This course provides an overview of office management. Through this course, students will gain the knowledge and skills necessary for effective office management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understanding of Office Management, Office Automation, space management, and workplace environment.

CO2. Learn the procedures of mailing as well as record management.

CO3. Students will be able to manage records.

CO4. Understand and acquire the skills for secretarial functions and proceedings of official meetings.

CO5. Understand the budgets and audit system in the Office.

### COMPUTER APPLICATIONS (CSE 119)

L	T	P
2	0	1

**Course Objective:** The course aims to equip students with essential knowledge and skills to effectively use computer applications and software for personal and professional purposes.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. This course intends to help the students to acquire basic knowledge about computer and its application in various areas of business.

CO2. Enable the students to understand the modern trends and technologies in computer.

CO3. Basic ideas of storage devices, computer Networks and Operating System.

CO4. Applying word processing concepts, power point concepts, analyze animation features and components.

CO5. Remember and understand the concepts of the Internet, analyze the role of data and information.

### **SPORTS (VAC 101)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>2</b>	<b>0</b>	<b>0</b>

**Course Objective:** The course aims to develop students' knowledge, skills, and appreciation of sports, promoting physical fitness, teamwork and sportsmanship.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Develop Socio-Psychological Aspects like Control of Emotions, Balanced Behavior, Development of Leadership and Followership Qualities, and Team Spirit.

CO2. Developing Management Skills to Understand and Organize Sports Tournaments.

CO3. Learn and Understand the Motor Abilities like Strength, Speed, Endurance, Coordination, and Flexibility.

CO4. Learn and Understand the Effect of Physical and Physiological Training on Women Athletes.

CO5. Understand the application of Laws and Principles of Physics in Sports and Games.

### **INDIAN CONSTITUTION AND FUNDAMENTAL RIGHTS (VAC 102)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>2</b>	<b>0</b>	<b>0</b>

**Course Objective:** To provide students with a comprehensive understanding of the Indian Constitution and the fundamental rights enshrined within it. The course aims to explore the historical context, principles, and provisions of the Indian Constitution, with a specific focus on fundamental rights.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the Fundamental Duties and its relevance.

CO2. Appreciate the values and goals embedded in the Fundamental rights and duties.

CO3. Recognize the importance of Fundamental Duties enshrined in the Constitution.

CO4. Apply the spirit of fundamental values and duties in everyday national life.

CO5. Understand governance, its strengths and lacunae in promoting and ensuring fundamental rights.



### **COST ACCOUNTING (BC 201)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>0</b>	<b>0</b>

**Course Objective:** To acquaint the students with basic concepts used in cost accounting, various methods involved in cost ascertainment, and cost accounting bookkeeping systems.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand thoroughly the conceptual framework of Cost Accounting; identification of differences between different financial and cost accounting; cost concepts and elements of cost; preparation of cost sheet.

CO2. Understand the accounting and control of material and labour costs.

CO3. Develop the ability to understand classification, allocation, apportionment, and absorption of overheads in cost determination; under and over absorption of overheads; and treatment of various items of overheads.

CO4. Develop the ability to calculate the cost of products, jobs, contracts, processes, and services after understanding the basic concepts and processes involved in them.

CO5. Understand cost accounting bookkeeping systems and reconciliation of cost and financial account profits.

### **HUMAN RESOURCE MANAGEMENT (BC 202)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** The objective of the course is to acquaint students with the techniques and principles of managing human resources of an organization.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the basic nature and importance of human resource management.

CO2. Analyze the current theory and practice of recruitment and selection.

CO3. Realize the importance of a performance management system in enhancing employee performance.

CO4. Recommend actions based on the results of the compensation analysis and design compensation schemes that are cost-effective, increase productivity of the workforce, and comply with the legal framework.

CO5. Understand the role of modern HRM in meeting the challenges of a changing business environment.

**INDIAN FINANCIAL SYSTEM (BC 203)**

L	T	P
4	0	0

**Course Objective:** To expose the students to the working of money and financial system prevailing in India and familiarize the students with regard to structure, organization and working of financial system in India.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the meaning and scope of financial markets as well as institutions in India.

CO2. Understand the concepts of Money Market and Capital Market.

CO3. Examine the Stock Exchange Operations.

CO4. Students studies non-banking financial institutions, their role in financial system, sources of finance and RBI guidelines.

CO5. Comprehend the need, definition, functions and economic significance of financial institutions and markets.

**BUSINESS ECONOMICS (ECON 110)**

L	T	P
4	0	0

**Course Objective:** The objective of this course is to develop basic understanding about the economic concepts, tools and techniques for their applications in business decisions.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand concept of scope of business economics Micro & macroeconomics.

CO2. Understand consumer behavior, consumer equilibrium, price elasticity and price consumption curve and price effect.

CO3. Develop ability to understand the concept of Cost of production and Market structures.

CO4. Ability to understand Consumption, saving and investment.

CO5. Understand the impact of balance of payment in an economy.

**LEADERSHIP SKILLS & TEAM MANAGEMENT (BBAOE 104)**

L	T	P
3	0	0

**Course Objectives:** To equip students with the knowledge and skills necessary to lead and manage teams effectively.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To inculcate managerial skills among themselves and will be able to contribute to the organizational growth.

CO2. Develop a crucial and appropriate Communication style adaptive to heterogeneous groups.

CO3. To understand the role of management and leadership in the smooth functioning of an organization.

CO4. Explain the basics of leadership during a crisis.

CO5. Compare and contrast cultural differences and global approaches to managing those differences.



### INDIAN ECONOMY (ECONOE 103)

L	T	P
3	0	0

**Course Objective:** The purpose of this course to understand the students' current changes in the Indian economy.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. It will result in a comprehensive understanding of the Indian Economy.

CO2. To acquaint students with the major policy regimes of government to resolve problems in agriculture, industry and service sector of India.

CO3. To give in-depth knowledge of the Demographic dimension.

CO4. To gain fundamental exposure to the role, structure, and functioning of international institutions/organizations.

CO5. To give in-depth knowledge of Banking & Finance to the students of economics with practical inputs and prepares them as a responsible customer.

### PERSONALITY DEVELOPMENT AND PRESENTATION SKILLS (BBAAE 101)

L	T	P
3	0	0

**Course Objective:** To help students enhance their presentation, communication and professional skills and capabilities.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Gather a detailed understanding of personality development, personality traits, types etc.

CO2. Learn their personality better and understand the stages of personality development and enhance their self-esteem.

CO3. Apprehend methods and ways to improve one's interpersonal relationship with those around them for better growth and opportunities.

CO4. Explain attitudes better and learn about negative and positive attitudes.

CO5. Learn about various skills for employability to enhance personality.

### BASICS OF STOCK MARKET (BCAE 101)

L	T	P
3	0	0

**Course Objective:** To provide students with a foundational understanding of the stock market and its key components. The course aims to equip students with essential knowledge and skills to navigate the stock market and make informed investment decisions.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Explain the basics of investing in the stock market, the investment environment as well as risk & return.

CO2. Analyze the Indian securities market including

CO3. To help them to understand security analysis.

CO4. To create an awareness about risk and return of different investments.

CO5. To make them understand the investment decisions and portfolio performance.

**FUNDAMENTALS OF E-ACCOUNTING (BCSE 101)**

L	T	P
2	0	0

**Course Objective:** To understand, analyze, and interpret the basic framework of E-Accounting and E- Filing of Returns.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Explain the role of E-Accounting in the current scenario.

CO2: Identifying and appreciating the data content in Tally ERP 9.

CO3: Examine how to prepare different books, ledgers trial balance and balance sheet.

CO4: Analyze the documenting transactions using vouchers and database design for accounting.

CO5: Evaluate the framework of generating reports in Tally ERP 9.

**BASICS OF MATHEMATICS (MATH 115)**

L	T	P
4	0	0

**Course Objective:** To familiarize the students with the basic mathematical tools with emphasis on applications to business and economic situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Ability to demonstrate thorough knowledge of mathematics.

CO2. The capacity to communicate precisely in other areas of human knowledge using mathematics.

CO3. Deepened grasp of the topic as it is presented in the curriculum.

CO4. Understand and sensitivity to societal concerns, environmental challenges, and development-related issues.

CO5. Attained proficiency in the subject area.

**HUMAN VALUES & PROFESSIONAL ETHICS (EDU 101)**

L	T	P
2	0	0

**Course Objective:** To create awareness of professional ethics and Human Values and appreciate the rights of others.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand and analyze the essentials of human values and skills, self-exploration, happiness, and prosperity.

CO2: Evaluate the coexistence of the “I” with the body.

CO3: Identify and evaluate the role of harmony in family, society, and universal order.

CO4: Understand and associate the holistic perception of harmony at all levels of existence.

CO5: Develop appropriate technologies and management patterns to create harmony in professional and personal lives.



### YOGA & HAPPINESS (VAC 103)

L	T	P
2	0	0

**Course Objective:** The course aims to provide students with a deeper understanding of the principles and techniques of yoga, as well as their role in promoting physical, mental, and emotional well-being.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO 1. Demonstrate Asanas, Pranayama, Kriya with proficiency.
- CO 2. Demonstrate postures of Hatha Yoga, Raja Yoga, and Laya Yoga.
- CO 3. Analyze the relevance of Yog Sutras in real life situations.
- CO 4. Interpret the significance of Meditation in Business Context;.
- CO 5. Summarize the importance of Ayurveda in modern lifestyle.

### CORPORATE ACCOUNTING (BC 211)

L	T	P
3	1	0

**Course Objective:** The course aims to help learners acquire conceptual knowledge of corporate accounting systems and to learn the techniques of preparing the financial statements of companies.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Explain the accounting for Share Capital, Debentures, Bonus Shares, Redemption of Preference Shares, and Debentures of a company.
- CO2. Prepare Financial Statements of Companies manually as well as using online software.
- CO3. Estimate the value of Intangible Assets and Shares
- CO4. Explain the Accounting for Amalgamation and Internal Reconstruction of Companies.
- CO5. Interpret and prepare Annual Reports of companies.

### CORPORATE ADMINISTRATION (BC 212)

L	T	P
3	0	0

**Course Objective:** To acquire the ability to analyze, interpret, and apply the provisions of the company law in practical situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the regulatory aspects and the broader procedural aspects involved in different types of companies covering the Companies Act 2013 and the Rules there under.
- CO2. To teach Company Law in relation to the necessary legal framework to be adopted in the day-to-day functions of the company.
- CO3. To understand the process of Winding up of the Companies.
- CO4. Enable the students to synthesis company processes, meetings, and decisions.
- CO5. Follow the basic legal documents and their usage essential for the operations and management of the company.

### **CORPORATE AUDITING (BC 213)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** The course aims to provide knowledge of auditing concepts, principles, procedures, and techniques by current legal requirements.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Discuss basic concepts of auditing and acquaint yourself with the latest developments in the area of auditing.

CO2. Describe the need for auditing and the role of auditors.

CO3. Demonstrate the principles, procedures, and techniques of auditing.

CO4. Interpret the contents of audit reports.

CO5. Analyze the provisions of the Companies Act, 2013 relating to auditor and auditing.

### **DECISION-MAKING SKILLS (BBAAE 201)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>2</b>	<b>0</b>	<b>0</b>

**Course Objective:** This course provides a deep dive into decision-making theories and models, fostering analytical skills essential for evaluating options and alternatives. Students will tackle cognitive biases, apply strategies in real-life scenarios, and hone communication for effective group decision-making, ultimately empowering them to make sound decisions in personal and professional realms.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO 1. Apply a robust decision-making process that works.

CO2. Evaluate the decision-making models and their pros and cons.

CO 3. Apply Problem-solving techniques in decision-making processes.

CO 4. Identify alternatives for a given problem and systematically evaluate each.

CO 5. Evaluate the application of decision-making skills in a practical scenario.

### **TIME MANAGEMENT & ORGANIZATION (BBASE 201)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>2</b>	<b>0</b>	<b>0</b>

**Course Objective:** This course focuses on instilling the significance of time management and organization while imparting strategies for goal setting and prioritization. Students will learn practical techniques for planning tasks efficiently, minimizing distractions, and boosting productivity through delegation and time-blocking.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. The Students will understand the concept of Time Management.

CO2. The Students will be able to identify ways to overcome time blocking and scheduling techniques, using digital and analog tools for planning.

CO3. The Students will acquire knowledge regarding different productivity techniques.

CO4. Apply stress management principles to achieve high levels of performance.

CO5. The Students will understand the application of time management and will learn about practical experience in real-life scenarios and develop a personal time management plan.



### BUSINESS STATISTICS (STAT 103)

L	T	P
4	0	0

**Course Objective:** To familiarize the students with various statistical data analysis tools that can be used for effective decision-making. Emphasis will be on the application of the concepts learned.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To apply the concepts of central tendency and variation in managerial decision-making.
- CO2. To understand the concept of correlation regression analysis and its applications.
- CO3. To utilize the time series method to predict the future of sales in a concern.
- CO4. To enhance knowledge in probability theory and normality and its distribution concepts.
- CO5. To design a good quantitative purpose statement and good quantitative research questions and hypotheses.

### PRINCIPLES OF MANAGEMENT (BBAMN 201)

L	T	P
3	0	0

**Course Objective:** To provide a basis of understanding to the students with reference to the working of business organizations through the process of management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Effectively manage an organization and successfully handle different managerial situations.
- CO2. Practice the process of management's four functions: planning, organizing, leading, and controlling.
- CO3. To recognize the human skills and conceptual skills as per industry requirements about basic management skills.
- CO4. Apply various tools that would facilitate the decision-making process in the business.
- CO5. To comprehend the application of various controlling techniques in management.

### SECTORAL ISSUES IN INDIAN ECONOMY (ECON 208)

L	T	P
3	0	0

**Course Objective:** This course aims to provide students with a comprehensive understanding of the major sectors comprising the Indian economy, including agriculture, industry, and services. Through analysis of sector-specific challenges, policies, and trends, students will develop insights into the dynamics shaping India's economic landscape, enabling them to evaluate the impacts of sectoral developments on national growth and development strategies.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. The syllabi equip students to comprehend and critically appraise Current Indian Economic Issues and GDP growth rate.
- CO2. To learn about the concept of NABARD and its role in sustainable agriculture in India.
- CO3. To know the reforms in Industrial policies before and after independence.
- CO4. To describe and examine the changing structure of planning process in India.
- CO5. Gain a sound command over the basic tenets of demography as well as key demographic issues and illustrations in the context of a large and diverse country like India.



**ENTREPRENEURSHIP & STARTUP-MANAGEMENT (BBAVC 201)**

L	T	P
3	0	0

**Course Objective:** This course is designed to provide students with a comprehensive understanding of entrepreneurship and the essentials of managing a startup venture. It covers various aspects of entrepreneurial theory, startup creation, innovation, opportunity recognition, business planning, financing, marketing, and growth strategies. Through lectures, case studies, guest speakers, and practical exercises, students will develop the knowledge, skills, and mindset necessary to navigate the challenges and opportunities of entrepreneurship and startup management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To explain the characteristics, functions, and traits of an entrepreneur.

CO2. To be able to develop an effective business plan.

CO3. Identify the different ways in which entrepreneurs manifest in start-ups.

CO4. Analyze start-up capital requirements by analyzing legal factors.

CO5. To examine entrepreneurial strategies to explore new entry opportunities, methods of enhancing creativity, and generation of ideas.

**INCOME TAX (BC 221)**

L	T	P
3	1	0

**Course Objective:** This course aims to impart knowledge of the law about the levy of income tax in India. It also aims to enable the students to apply the same practically.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand the basic concepts in the law of income tax and determine the residential status of different persons.

CO2: Identify the five heads in which income is categorized and compute income under the heads 'Salaries' and 'Income from House Property'.

CO3: Compute income under the head 'Profits and gains of business or profession', "Capital gains" and 'Income from other sources'.

CO4: Understand clubbing provisions, aggregate income after set-off and carry forward of losses, and deductions allowed under the Income Tax Act; and further compute taxable income and tax liability of individuals and firms.

CO5: Develop the ability to file online returns of income.

**MANAGEMENT ACCOUNTING (BC 222)**

L	T	P
3	0	0

**Course Objective:** The course aims to enable students to acquire knowledge of concepts, methods, and techniques of management accounting for managerial planning, control, and decision-making.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Examine the conceptual framework of Management Accounting and identify the differences between various forms of accounting.

CO2. Analyze budgetary control system as a tool of managerial planning and control

CO3. Evaluate the standard costing system as a tool of managerial control.

CO4. Recognize the concept of marginal costing and cost-volume-profit analysis.

CO5. Analyze techniques of decision-making and discuss the concept of responsibility accounting and performance measurement.

**FINANCIAL INSTITUTIONS & SERVICES (BC 223)**

L	T	P
3	0	0

**Course Objective:** This course provides a deep understanding of various financial institutions and services in India that exist in an economic system.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the role and functioning of financial institutions and services.
- CO2. Enrich their knowledge of key areas relating to the management of financial products and services.
- CO3. Ability to understand the concept of Financial services along with the basic forms,
- CO4. Understand the role of the Central Bank and SEBI in the Financial market.
- CO5. Differentiate and understand the concept of Merchant Banking and to evaluate investment performance and portfolio revision techniques.

**ESSENTIALS OF E-COMMERCE (CSE 321)**

L	T	P
3	0	0

**Course Objective:** To enable the student to become familiar with the mechanism for conducting business transactions through electronic means.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the basics of E-commerce and current and E-business applications.
- CO2. Familiarize with E-Commerce security and control systems.
- CO3. Identify the emerging modes of e-payment and digital banking systems.
- CO4. Enhance the students' skills for Digital signatures.
- CO5. Understand the importance of security, privacy, ethical and legal issues of e-commerce.

**ENVIRONMENTAL STUDIES (EVS 301)**

L	T	P
3	0	0

**Course Objective:** To create environmental awareness among the students and gain knowledge on different types of pollution in the environment.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Gain in-depth knowledge on natural processes that sustain life, and govern economy.
- CO2. Predict the consequences of human actions on the web of life, global economy and quality of human life.
- CO3. Develop critical thinking for shaping strategies (scientific, social, economic and legal) for environmental protection and conservation of biodiversity, social equity and sustainable development.
- CO4. Develop critical thinking and/or observation skills, and apply them to the analysis of a problem or question related to the environment.
- CO5. Understand the principles of ecology and environmental pollutions and issues that apply to air, land, and water issues on a global scale,



## CHANGE MANAGEMENT & ORGANIZATIONAL DEVELOPMENT

(BBAMN 202)

L	T	P
3	0	0

**Course Objective:** To equip students with the theories, models, and practices associated with managing organizational change and ensuring continuous improvement.

### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. Better understanding of the change management models.

CO2. Sensitizing the students about how organizations can be made more effective and dynamic through improving its human resource.

CO3. Developing basic behavioral science skills of the students as future practitioners of OD.

CO4. Understanding and applying basic concepts and processes that form the core of organization development.

CO5. Analyze the Concepts of MB and team building, types of teams and team development process.

## INTRODUCTORY DEVELOPMENT ECONOMICS (ECON 209)

L	T	P
3	0	0

**Course Objective:** This course aims to introduce students to the fundamental concepts, and theories in the field of development economics. Through analysis of key issues such as poverty, inequality, economic growth, and globalization, students will develop a comprehensive understanding of the factors influencing economic development in both developed and developing countries.

### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. Understand the fundamental problems of an economy and the optimal allocation of resources to meet the needs of the society.

CO2. Learn different measures of poverty and inequality and explore the connection between growth and inequality.

CO3. Understand the determinants of capital formation in India.

CO4. To equip with knowledge about different aspects of economic development, population, and development.

CO5. To impart theoretical knowledge about the concepts of Manpower planning and problems in India.

**PERSONAL BRANDING & LEADERSHIP SKILLS (BBAVC 202)**

L	T	P
3	0	0

**Course Objective:** This course is designed to provide students with the knowledge, strategies, and practical tools to develop and enhance their personal brand and leadership capabilities.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Critically evaluate different elements of personal branding (self-awareness in the context of brand identity, brand image, authenticity, and statement).

CO2. Demonstrate understanding of the key features of, and trends in personal branding, including digitalization and application by professionals across new media.

CO3. Comprehend leadership qualities and their importance.

CO4. Understand how to develop leadership qualities.

CO5. Apply theoretical concepts to develop and promote the personal brand of professionals.

**GST & CUSTOMS LAWS (BC 301)**

L	T	P
3	1	0

**Course Objective:** To impart knowledge of principles and provisions of GST and Customs Law, the important legislation dealing with the indirect tax system in India; and to enable the students to apply the same practically.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Connect with the genesis of goods and services tax (GST), decipher the constitutional amendment carried out to install GST in India, and comprehend the composition and working of the GST council.

CO2: Understand the meaning of supply under GST law, differentiate between intra-state and inter-state supply, comprehend rules related to the place of supply, and compute the value of supply.

CO3: Comprehend the utilization of input tax credit, and the reverse charge mechanism of paying GST and know the procedure for claiming a refund under GST law.

CO4: Understand the provisions for registration under GST along with special provisions such as those related to anti-profiteering; avoidance of dual control; e-way bills and penalties.

CO5: Know the basic concepts of the Customs Act and compute the assessable value for charging customs duty.

**FINANCIAL MANAGEMENT (BC 302)**

L	T	P
3	1	0

**Course Objective:** To familiarize the students with the principles and practices of financial management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Explain the nature and scope of financial management as well as the time value of money and risk-return trade-off.

CO2. Estimate various capital structure theories and factors affecting capital structure decisions in a firm.

CO3. Compute cost of capital and develop innovative financial strategies.

CO4: Critically examine various theories of dividends and factors affecting dividend policy.

CO5: Evaluate working capital estimation and their requirements.



### PRINCIPLES OF INSURANCE (BC 303)

L	T	P
3	1	0

**Course Objective:** : This subject aims to provide students with the knowledge of general principles and practices of insurance. It is designed to help students understand the theories, regulatory framework of insurance, types of insurance, and the major types of insurance products.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. Know the structure and operations of an insurance company.

CO2. Explain the legal aspects of an insurance contract.

CO3. Understand the relationship between insurance rates, exposure units, and insurance premiums.

CO4. Describe the benefits of effective risk management.

CO5. Have conceptual Knowledge of insurance and understanding of life insurance and general Insurance.

### HUMAN RESOURCE DEVELOPMENT (BBAMN 301)

L	T	P
3	0	0

**Course Objective:** This course aims to provide an overview of human resource development practices to improve organizational effectiveness and create an optimal HRD climate.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. To build an understanding and perspective of Human Resource Development as a discipline appreciating learning.

CO2. To learn about performance appraisals and their techniques in an organization.

CO3. To learn the role of learning in action as an individual, group, and organization to develop creative strategies for organizational problems.

CO4. The students would have gained knowledge on the concepts of legal compliance of HRD.

CO5. To understand the contemporary realities of HRD and its interface with technology.

### RURAL DEVELOPMENT & POLICIES (ECON 310)

L	T	P
3	0	0

**Course Objective:** This course aims to provide students with a comprehensive understanding of the socio-economic dynamics, challenges, and opportunities in rural areas.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. To gain knowledge pertaining to rural development and policies.

CO2. It will help them to become sensitive to issues of equity and inclusive development and make them aware about policies, plans and programmes.

CO3. To study the role of infrastructural facilities and governance in rural development.

CO4. To understand the development schemes and programmes of government.

CO5. Students can guide the SHG groups and capability to start entrepreneurial activities.



### **E-FILING OF RETURNS (BCVC 301)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>2</b>	<b>0</b>	<b>1</b>

**Course Objective:** The Objective of this course is to equip students with the knowledge and skills necessary to effectively and accurately file tax returns electronically, leveraging digital platforms and tools for streamlined and efficient tax compliance processes.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Know the difference between e-filing and regular filing of Income tax returns and understand the circumstances when e-filing is mandatory.

CO2. To understand the basic process of computing taxable income and tax liability, and know about various types of income tax return forms

CO3. Understand the concept of advance payment of tax and tax deduction at source and develop the ability of e-filing of TDS returns.

CO4. Become aware of the basic framework and structure of GST, including the meaning of input tax credit and the process of its utilization

CO5. Know about various types of GST returns and their filing.

### **FOREIGN EXCHANGE MANAGEMENT (BC 311)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**Course Objective:** The course aims to familiarize the students with the principles and practices of foreign exchange management.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Describe the International Monetary System and the nature and scope of international finance.

CO2. Discuss various aspects of Foreign Exchange Markets.

CO3. Analyze the factors affecting the exchange rates.

CO4: Describe International Financial Markets and Instruments.

CO5: Evaluate various kinds of risks due to fluctuation in the exchange rate and management of these risks.

### **COMPUTERIZED ACCOUNTING (BC 312)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**Course Objective:** This course aims to make students understand and acquire basic knowledge of Computerized accounting systems and their applications in the area of business.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand the Computerized Accounting System (CAS) environment.

CO2: Create a structure of a Computerized Accounting System for a business firm.

CO3: Record day-to-day business transactions in a Computerized Accounting System.

CO4: Make different types of voucher entries by editing, deleting, and printing the vouchers

CO5: Make necessary tax adjustments while recording business transactions and to generate various Accounting Reports for analysis and decision-making.

### **BANKING PRODUCTS AND TECHNOLOGY (BC 313)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**Course Objective:** The course aims to create awareness about the various Banking Products and conversant with different aspects of technology used in banking and issues related to banking products in terms of delivery and security with reference to India.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Assess different banking products and the basic concepts of electronic banking.
- CO2. Discuss different digital banking products and services offered.
- CO3. Analyze the various electronic payment systems available.
- CO4: Discuss the Electronic Fund Transfer system.
- CO5: Recognize different types of security threats in Indian Banking.

### **INVESTMENT MANAGEMENT (BC 314)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**Course Objective:** The course aims to familiarize learners with different aspects of investment management and risks, introduce them to the framework of securities analysis and valuation, and highlight the process of portfolio management.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Analyze the environment of investment and risk-return framework.
- CO2. Describe bonds in terms of valuation, yields, and risks.
- CO3. Analyse equity shares using different approaches and models.
- CO4: Construct, analyze, select, and evaluate portfolios along with a deep understanding of capital market theory and associated models.
- CO5: Comprehend and analyze futures and options and to be able to devise our investment strategies using various options trading strategies in the derivative market.

### **FUNDAMENTALS OF COMPENSATION MANAGEMENT (BBAMN 303)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** To familiarize students with concepts of performance and compensation management and how to use them to face the challenges of attracting, retaining and motivating employees to high performance.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To understand performance appraisal and development of good compensation plans in the organizational setting.
- CO2. To understand and perform job evaluation for various job positions in different fields.
- CO3. Design rational and contemporary compensation systems in modern organizations.
- CO4. To appraise the present trends in the calculation of incentives and other pay systems.
- CO5. To comprehend the significance of wages and the various ways that organizations establish their wages.



**BASIC RESOURCES & ENVIRONMENTAL ECONOMICS (ECON 311)**

L	T	P
3	0	0

**Course Objective:** This course aims to provide students with a foundational understanding of the principles, theories, and frameworks governing the allocation, utilization, and management of natural resources and environmental assets.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To understand key concepts in the field of environmental and natural resource economics.

CO2. To characterize the waste and apply the knowledge of laws for municipal waste management, for handling of biomedical wastes, and for handling of plastic wastes.

CO3. Learn about local and international environmental issues of climate change.

CO4. To learn about the Kyoto Protocol principle which is concerned with the polluter pays principle.

CO5. To account for different criteria concerning sustainable development goals.

**ARTIFICIAL INTELLIGENCE IN BUSINESS (BCVC 302)**

L	T	P
3	0	0

**Course Objective:** This course aims to offer students a basic overview of the theories and practices that support the use of artificial intelligence (AI) in business. The course illustrates the potential and current constraints of these approaches using cases from several disciplines.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the fundamental concepts of AI and its applications in the business context.

CO2. Learn how AI helps in making better decisions making.

CO3. Learn how AI strategies and technologies are helpful in Measuring & Evaluating performance of business.

CO4. Analyze the application of AI in business transformation such as accounting, finance and HRM.

CO5. Describe the future of AI in business management.

**ACCOUNTING FOR EVERYONE (BCOE 101)**

L	T	P
3	0	0

**Course Objective:** The course aims to help learners coming from non-commerce backgrounds acquire basic knowledge of financial accounting and to impart preliminary skills for recording various kinds of financial transactions and prepare financial statements.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Analyze various terms used in accounting.

CO2. Make accounting entries and prepare cash book and other accounts necessary while running a business.

CO3. Prepare accounting equation of various business transactions.

CO4. Analyse information from company's annual report.

CO5. Comprehend and analyze information from the company's annual report.

## **BUSINESS AND COMMERCIAL KNOWLEDGE (BCOE 102)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** The course aims to develop an understanding of common business and commercial concepts and to keep abreast with developments in the business and commercial world.

### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Describe the domains of Business and Commercial Knowledge (BCK).
- CO2. Distinguish the business from the myriad of human activities, more so from employment and profession perspectives.
- CO3. Understand the concept of business environment with its characteristics and importance.
- CO4. Have an overview of corporate history of some of the selected Indian and Global companies.
- CO5. Highlight the pervasiveness of the influence of government policies on business.

## **PERSONAL FINANCIAL PLANNING (BCOE 103)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** The course aims to familiarize learners with different aspects of personal financial planning like savings, investment, taxation, insurance, and retirement planning and to develop the necessary knowledge and skills for effective financial planning.

### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the meaning and appreciate the relevance of financial planning.
- CO2. Understand the concept of investment planning and its methods.
- CO3. Examine the scope and ways of personal tax planning.
- CO4. Analyze insurance planning and its relevance.
- CO5. Develop insight into retirement planning and its relevance.

## **PROJECT MANAGEMENT (BCOE 104)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

**Course Objective:** The course aims to enable the learners to evolve a suitable framework for the preparation, appraisal, monitoring, and control of projects undertaken in an organization.

### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Relate the concept and attributes of projects, project management system, process, and its principles.
- CO2. Perform technical feasibility, marketing feasibility and commercial viability; using NPV, and further to understand tax and legal aspects of a project.
- CO3. Develop a schedule for a specific project and its appraisal using various techniques.
- CO4. Calculate project duration and assess project cost.
- CO5. Evaluate project management in terms of risk and performance.



**FUNDAMENTALS OF ACCOUNTING & BOOK-KEEPING (BCM N 301)**

L	T	P
3	0	0

**Course Objective:** The main objective of this course is to understand a basic understanding of bookkeeping and accountancy and to provide analytical ability among the students and prepare them for employability.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand and apply the essential numerical skills required for bookkeeping and accounting.

CO2. Acquire knowledge in accounting, the system of maintenance of accounts, journals, ledger, bill of exchange, account current, average due date, and bank reconciliation statement.

CO3. Explain the concept of ledger and its importance in accounting process.

CO4. State the need and objective of preparing trial balance and develop the skill of preparing trial balance.

CO 5. Equip with the knowledge of depreciation, accounting process and preparation of final accounts of sole trader.

**ADVANCED ACCOUNTING (BCM N 302)**

L	T	P
3	0	0

**Course Objective:** The course aims to help the students acquire conceptual knowledge and understanding of basic accounting principles and practices o to impart skills for recording various kinds of business transactions and preparing financial statements.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Identify transactions and events that need to be recorded in the books of accounts.

CO2. The students will know the rules applicable to Partnership firms and learn the importance of having a partnership deed in writing.

CO3. The student will be able to distinguish between the sacrificing ratio and gaining ratio and compute the retiring / deceased partner's share till the date of retirement/ death, taking into consideration all accumulated profits and losses.

CO4. Articulate the fundamental concepts of corporate accounts like Issue of Shares, Underwriting of Shares

CO5. Understand the concept of shares capital and types of shares and accounting procedure of share capital.

**FUNDAMENTALS OF TAXATION SYSTEM IN INDIA (BCM N 303)**

L	T	P
3	0	0

**Course Objective:** To understand the constitutional provisions governing taxation in India and to create an understanding of the GST framework as well as taxes levied by State Government and Local Bodies and the amendments carried out to implement GST in India.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. The students will be able to understand the basic taxation structure in India as per the Constitution of India.

CO2. To understand the concept of tax and different levels of tax.

CO3. Students would identify the technical terms related to Income Tax.

CO4. Able to identify the different taxes imposed by the state government on the sale or purchase of goods and professions.

CO5. To provide adequate knowledge in the application of Goods and service tax in day-to-day business.

**TAX PLANNING & MANAGEMENT (BCM N 304)**

L	T	P
3	0	0

**Course Objective:** This course aims to provide a comprehensive understanding of tax laws, regulations, and strategies, enabling students to effectively navigate the intricacies of tax planning and management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Identify the objectives of basic tax planning strategies.

CO2. To acquaint the students with theoretical and practical knowledge of tax planning and management techniques.

CO3. To familiarize the students with major and latest provisions of the India tax laws and related judicial pronouncements pertaining to various assesses with a view to derive maximum possible tax benefits admissible under the law.

CO4. Describe the tax compliance process and the tax professional responsibilities in providing tax advice.

CO5. Compare and contrast the tax implications of a variety of personal investment and retirement plans.



## INTRODUCTION OF THE PROGRAMME

M. Com. curriculum that gives students both specific skill in the topic of study and a general understanding of management and commerce. It is centered on banking, finance, and human resources. The major objectives of the curriculum are to give students the analytical, entrepreneurial, and conceptual skills necessary to oversee complex, contemporary commercial operations at the national and international levels. In addition to business consulting, M.Com. program graduates typically find work in fields like project management, marketing, financial services, and general management.

## SALIENT FEATURES OF THE PROGRAMME

- 1. Provision for specialization:** Through this programme the students get specialization in finance, human resource and marketing and counselling skills for managers.
- 2. Courses like Research Methodology:** One of the objectives of this programme is related to research. To achieve higher orientation towards research outcomes, focus is on the core courses of research methodology and econometrics.
- 3. Curriculum designed to prepare:** All course in this programme is mapped with UGC and other competitive exams.

## PROGRAMME OUTCOMES (POs)

Program outcomes are more focused statements that outline the knowledge and skills that students should possess by the time they graduate. These have to do with the abilities, know-how, and attitudes that students pick up during their program of study.

- 1. Development of Solutions:** Apply analytical decision-making skills to solve issues by utilizing research tools and cross-functional expertise.
- 2. Technical Proficiency:** Use industry-specific software to carry out accounting tasks.
- 3. Research Orientation:** Apply research and statistical techniques to analyze company issues and problems.
- 4. Sustainability and Ethics:** When making or proposing business decisions, take into account sustainability issues and professional ethics.
- 5. Communication:** For social and professional contexts, practice using clear written and spoken communication approaches.
- 6. Leadership and Teamwork:** Show that you have what it takes to take the initiative or work well with others as a team member when organizing events or doing tasks.
- 7. Life Long Learning:** Value and ability for lifelong learning should be acknowledged.

## PROGRAMME SPECIFIC OUTCOMES (PSOs) IN GENERAL

**PSO1:** To inculcate the knowledge of business and the techniques of managing the business with special focus on marketing, Insurance and banking theory law and practices.

**PSO2:** Discuss about the key areas of Financial Management, Marketing, Accounting Standards and Reporting System, Project finance and management, business environment, digital technologies in banking, insurance, human resource skill in maintaining the quality of work life in an organization.

**PSO3:** To develop the decision-making skill through costing methods and practical application of management accounting principles.

**PSO4:** To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, auditing and entrepreneurial development.

**PSO5:** To create awareness in application-oriented research through research for business decisions.

**PSO6:** To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, auditing and entrepreneurial development.

**PSO7:** To enhance the computer literacy and its applicability in business through latest version on tally and e-commerce principles.

## **PROGRAMME SPECIFIC OUTCOMES (PSOs) ACCORDING TO SPECIALIZATION**

### **1. PROGRAMME SPECIFIC OUTCOMES (PSOs): M. COM. – FINANCE**

**PSO1:** To give the students the opportunity to put their understanding of costing methods, financial analytical instruments, and accounting standards to use.

**PSO2:** Examining an organization's financial performance using a range of instruments to support decision-making.

**PSO3:** Students will be able to see how important decisions about financing, investing, and dividends are to the company's expansion.

**PSO4:** Students are given the opportunity to broaden their understanding of the range of financial markets and services offered by various financial institutions.

**PSO5:** To assess and comprehend the different investment options with relation to risk and return and to gain a wider understanding of the financial aspects of risk management on a global scale.

### **2. PROGRAMME SPECIFIC OUTCOMES (PSOs): M. COM. - HUMAN RESOURCE**

**PSO1:** Recognize the fundamental ideas of human resource management and how they apply to individuals, groups, and organizations.

**PSO2:** Theoretical understanding in related fields such as communication, corporate ethics, organizational behaviour, quantitative management approaches, labour and industrial regulations, etc.

**PSO3:** Real-world experience and practical understanding in a range of HR-related topics, including performance reviews, hiring and selection, change management, handling conflict, stress, and counselling.



**PSO4:** Through two project studies—one theoretical (an organizational study) and the other practical (a problem-cantered study)—practical exposure to the challenges and opportunities of human resources management is provided.

### **3. PROGRAMME SPECIFIC OUTCOMES (PSOs): M. COM. – MARKETING**

**PSO1:** Equip students to handle a wide range of marketing issues in today's cutthroat corporate climate, from managing sales to supervising worldwide marketing and distribution operations to comprehending the changing wants of the consumer.

**PSO2:** Targeting the unique decision-making process of the consumer and the internal and external factors influencing their behaviour.

**PSO3:** Gaining a basic understanding of service marketing, including its marketing mix and the role that people play in it.

**PSO4:** Sales promotion development and usage nature, growing importance of sales promotion, samples and purchase points, implementing and evaluating the sales promotion programs, significance of public relations, corporate image building.

**PSO5:** Gain an understanding of marketing fundamentals, the marketing environment, and the use of communication.

**PSO6:** Gain an understanding of the different forms of advertising, their applications and usage in relation to marketing scenarios, their role in global marketing, their use in advertising campaigns, and their budgetary estimation.

### **M. COM. 1<sup>st</sup> SEMESTER**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>0</b>	<b>0</b>

### **MANAGEMENT CONCEPTS AND ORGANIZATIONAL BEHAVIOUR (MC-501)**

**Course Objective:** The course is intended to help students understand the conceptual framework of Management and organizational behaviour and discover the facts and the relationships among them in organizations for developing a more accurate appreciation of the managerial realities.

#### **Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the concepts related to Business.

CO2. Demonstrate the roles, skills, and functions of management.

CO3. Analyze the effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

CO4. Demonstrate the applicability of the concept of organizational behaviour to understand the behaviour of people in the organization.

CO5. Understanding the concept of perception, factors influencing the perception, and theories of motivation.

**M. COM. 1<sup>st</sup> SEMESTER**

L	T	P
3	1	0

**MANAGERIAL ECONOMICS (ECON-555)**

**Course Objective:** The objective of this course is to make the students conversant with such basic concepts and tools of economic analysis, which have an important bearing on managerial decision-making, which would enable the students to understand the economic forces governing industry and business.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO 1. Understanding the basic concepts of managerial economics.

CO 2. Understanding the reasons for existence of firms.

CO 3. Basic concepts of demand, supply and equilibrium and their determinants and also analyzing the effect of these factors on market.

CO 4. Understanding the basic concept of measuring elasticity and apply the concepts of price, cross and income elasticity, main determinants of elasticity and analyze how elasticity affects revenue.

CO 5. Understanding the concepts, importance and applications of different forecasting techniques.

**M. COM. 1<sup>st</sup> SEMESTER**

L	T	P
3	1	0

**ACCOUNTING FOR MANAGERIAL DECISIONS (MC-502)**

**Course Objective:** The objective of the course is to acquaint students with the accounting concept, tools, and techniques for managerial decisions.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand and enhance the understanding of the Accounting for Decision-making.

CO2. To facilitate the students to have a deep understanding of Variable costing.

CO3. Understand various types of costs, break-even analysis, Variance analysis and budgeting techniques.

CO4. To bring about the awareness of Responsibility Accounting and Responsibility Centres.

CO5. Students know about Performance Measurement.

**M. COM. 1<sup>st</sup> SEMESTER**

L	T	P
3	1	0

**QUANTITATIVE TECHNIQUES (MC-503)**

**Course Objective:** The objective of the course is to acquaint the students with the use of quantitative models in decision-making and to provide ground for learning advanced analytical tools used in research.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Demonstrate their understanding of the various measures of central tendency

CO2. Understanding of the time series analysis and its use in business and research.

CO3. Understanding the probability, queuing theory, replacement theory and theory on simulation of management systems.

CO4. Use CPM and PERT techniques, to plan, schedule, and control project activities.

CO5. Compile Probability distributions from the frequency distributions.



**M. COM. 1<sup>st</sup> SEMESTER**

L	T	P
3	1	0

**STRATEGIC HUMAN RESOURCE MANAGEMENT (MC-504)**

**Course Objective:** The objective of this course is to make the students conversant with Strategic Human Resource Management practices and the role of Human Resource Manager in the changing environment.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To develop an understanding of the concept of human resource management and to understand its relevance in organizations.

CO2. To develop a necessary skill set for the application of various HR issues.

CO3. To analyze the strategic issues and strategies required to select and develop manpower resources.

CO4. To integrate the knowledge of HR concepts to make correct business decisions.

CO5. To enable the students to integrate the understanding of various HR concepts along with the domain concept in order to make correct business decisions.

**M. COM. 1<sup>st</sup> SEMESTER**

L	T	P
3	1	0

**RESEARCH METHODOLOGY (RM-599)**

**Course Objective:** The main aim of this course is to introduce the basic concepts in research methodology in social science. This course addresses the issues inherent in selecting a research problem and discusses the techniques and tools to be employed in completing a research project. This will also enable the students to prepare report writing and framing Research proposals.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Students who complete this course will be able to understand and comprehend the basics in research methodology and apply them in research work.

CO2. This course will help them to select an appropriate research design.

CO3. The students will develop skills in qualitative and quantitative data analysis and presentation.

CO4. Students will be able to demonstrate the ability to choose methods appropriate to research objectives.

CO5. Ability to develop skills to draft a research paper.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
4	1	0

**ADVANCED ACCOUNTING (MC-505)**

**Course Objective:** The primary objective of this subject is to enlighten the students on the theoretical aspects of different topics and special attention to chapters like Inflation accounting, Holding Companies, and Bank and Insurance Company accounts.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Students acquire the knowledge of Accounts of Banking Companies.

CO2. Students will gain knowledge on the preparation of accounts of insurance companies.

CO3. The students will be able to develop knowledge of the holding company concept & preparation of a consolidated balance sheet.

CO4. The student will be able to learn about Inflation accounting and the CPP method.

CO5. Understand about the Human Resource Accounting in India.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
4	1	0

**STRATEGIC FINANCIAL MANAGEMENT (MC-506)**

**Course Objective:** The course aims to lay down the strategic importance of financial management. The course is structured in such a way that the students learn about the classical financial management concepts and also learn problem solving with constraints. The several aspects of financial management are meant to be discussed in details so that the students develop case solving ability in financial management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Relate the theoretical knowledge of strategic decision making with financial policy and organizational goals.

CO2. Solve practical problems on capital budgeting decisions.

CO3. Understand how a firm determines its capital structure.

CO4. Understand the importance of liquidity in a firm.

CO5. Develop the knowledge about the importance or futility of dividend payment through classical theories.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**STRATEGIC MARKETING MANAGEMENT (MC-507)**

**Course objective:** The course aims to provide students' a holistic understanding and knowledge in strategic marketing and the application of marketing in business and organizational settings and global practices of product development and marketing communication strategies.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Compare and contrast the key principles of marketing strategy.

CO2: Explain marketing and strategy concepts and ideas in their own words.

CO3: Think strategically about marketing issues and provide recommendations.

CO4: Identify market potential and communicate value to customers.

CO5: Prepare a professional, logical and coherent report in the form of a marketing plan.



**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**FUNDAMENTALS OF BUSINESS ANALYTICS (MC-508)**

**Course objective:** This course is designed to equip students with the knowledge and skills needed to business analytics and to bring knowledge about the Decision Making and to know about the approaches in Decision Making.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To define and understand the importance of business analytics and data science in business process and industry.

CO2. the student will be able to understand the Categories of Business Analytical methods and models.

CO3. to understand the Role and Significance of Decision Making.

CO4. the student will be aware of the Modern Approaches in Decision Making and Common Problems in Decision Making.

CO5. the student will be able to know Value of Analytics in Decision Making.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**EXPORT AND IMPORT MANAGEMENT (MC-509)**

**Course Objective:** The main aim of this subject to enhance the understanding of the International Trade procedure and Foreign Trade Policy and bring about the awareness regarding the Guidelines of Import Procedure.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Understand the International Trade and Foreign Trade Policy.

CO2. The student will be able to know the Balance of Payments and FEMA.

CO3. Understand the Export Procedure and Export Documents.

CO4. Students will be aware of the Guidelines of Import Procedure.

CO5. To know Export Pricing, Financing and EXIM Bank.

**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	0	1

**COMPUTER AND OFFICE MANAGEMENT (CSE-551)**

**Course Objective:** To familiarize the students with the fundamentals of computers and to implement the Principles of Computers in business operations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To make the students understand the basic concepts of Computers and Computer processing.

CO2. To expand the understanding of languages, MS Office, and MS Excel functions, methods and applications in business.

CO3. Students will be able to support management in office administration.

CO4. Learn by doing MS Power Point and MS Word applications in preparing business documents.

CO5. Students will be able to utilize appropriate office technology. Students will also be able to execute the duties of an office administrator and to know about the role of management in the workplace, levels and functions of management

**M. COM. 3<sup>rd</sup> SEMESTER**

**ENTREPRENEURSHIP & SMALL BUSINESS  
MANAGEMENT (MC-510)**

L	T	P
3	0	0

**Objective:** The basic objective of this course is to develop an understanding of basic concepts in the area of entrepreneurship and also highlight the role and importance of entrepreneurship for economic development.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To be familiarized with the fundamentals of entrepreneurship and its role in economic development and to motivate them towards entrepreneurial activities.

CO2. To understand the concept of entrepreneurial development and how far different institutions have helped in the overall development of Entrepreneurship.

CO3. To understand the concept of entrepreneurial motivation and its applicability to different sectors of the economy for overall development.

CO4. To know the importance of rural entrepreneurship and how rural entrepreneurship can help in the overall economic development of India

CO5. To make students aware about how small business are formed in the light of the legal and regulatory framework in India.

**M. COM. 3<sup>rd</sup> SEMESTER**

**PROJECT MANAGEMENT (MC-511)**

L	T	P
3	1	0

**Objective:** The aim of the course is to enable the student to evolve a suitable framework for the preparation, appraisal, monitoring and control and hedge risk of industrial project. The course would also help to understand the role of financial services in project management and would make its student understand how to mobilise finance for domestic and international projects.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understanding the scope, cost, timing, and quality of the project, at all times focused on project success.

CO2: Analyzing the project appraisal techniques with respect to market & demand analysis, situation analysis, collection of information, demand forecasting and market planning.

CO3: Understanding the technical and financial analysis with respect to a project.

CO4: Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements.

CO5: Understanding the role and responsibilities of the project manager, planning, organizing, controlling, project review and administrative aspect and skills of the project manager.



**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
1	0	0

**INTERNATIONAL MARKETING (MC-512M)**

**Course Objective:** To familiarize the students with the concept and issues of international marketing and enable them to be able to analyze the foreign market environment and develop international marketing strategies for a business firm.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: To gain know how of diverse theories and concepts related to the International Marketing environment.

CO2: The students will be able to put in use the marketing concepts in realization of organizations goals of going international.

CO3: To make students capable of evaluating the various components of PESTLE analysis and thereof planning the international marketing decisions.

CO4: To justify the use of global marketing practices in leveraging the advantages of international trade.

CO5: To hypothesize an international marketing environment and implement the marketing mix tools to create a marketing campaign.

**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	1	0

**SUPPLY CHAIN AND LOGISTIC MANAGEMENT (MC-513M)**

**Course Objective:** This course is intended to provide an understanding of the components and processes of supply chain and logistics management as well as the performance drivers of supply chain. It is also intended to help the students to learn about logistics, transportation, warehousing and outsourcing decisions.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand how Supply chain is supportive for enhancing business.

CO2: Develop insights into Supply chain management concepts and its impact on Business.

CO3: Demonstrate the importance of Logistics and Technology in SCM.

CO4: Understanding how world class manufacturing is impacting on Indian Markets.

CO5: Impart the understandings of Design for Logistics concepts that are used to control logistics cost and make the supply chain more efficient.

**M. COM. 3<sup>rd</sup> SEMESTER****FINANCIAL DERIVATIVES (MC-512F)**

L	T	P
3	1	0

**Course Objective:** The basic objective of this subject is to provide knowledge about various derivatives which are used in financial markets. The course will provide the students an understanding of the inter-linkages and regulatory frame-work within which the system operates in India.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Analyse and price diverse derivatives products to generate an optimal risk management strategy.

CO2: Demonstrate critical thinking, analytical and problem-solving skills in the context of derivatives pricing and hedging practice.

CO3: Explain the binomial model and its extension in continuous time to the Black-Scholes model.

CO4: Demonstrate an understanding of pricing forwards, futures and options contracts

CO5: Be able to describe standard derivative contracts, their properties and functionality, skills and abilities.

**M. COM. 3<sup>rd</sup> SEMESTER****SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (MC-513F)**

L	T	P
3	1	0

**Course Objective:** The objective of the course is to establish a conceptual framework for the study of security analysis and portfolio management. This course will provide the student the ability to understand and utilise the skill of optimising returns. The focus at different places is to build models and discuss their validity and application to practical situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand the basic structure and working of primary and secondary financial markets in India and conversant with computation of risk and return measures for financial instruments.

CO2: Understand secondary market trading

CO3: Understand and appreciate the Fundamental and Technical analysis tools for analyzing financial securities.

CO4: Well versed with the concept of a Portfolio and understand the principle portfolio theories.

CO5: Acquaint and understand portfolio analysis, portfolio evaluation and portfolio revision techniques.

**M. COM. 3<sup>rd</sup> SEMESTER****ECONOMIC AND ACCOUNTING ASPECTS OF HUMAN CAPITAL (MC-512H)**

L	T	P
3	1	0

**Course Objective:** The course provides detailed framework of all aspects on the economics of labour components of intellectual capital and the accounting aspects of Human Capital. It will also provide relevant knowledge to the learners in order to solve specific labour economics problems.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: To describe theories of wage determination and develop wage policy and wage plans.

CO2: To explain concept and components of intellectual capital along with TRIPS and generate patentable ideas.

CO3: To apply various models of human resource accounting as per decision requirement.

CO4: To link HR metrics to business outcomes using annual reports of companies.

CO5: To link HR scorecard to balanced scorecard.



**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	1	0

**MANAGEMENT OF INDUSTRIAL RELATIONS (MC-513H)**

**Course Objective:** The objective of the course is to make student practically equipped to manage the industrial relations in the light of numerous augmentations in the area of Industrial relations. The course will make them understand the importance of industrial relations for an organization and the ways and means to create industrial harmony at different levels of the organization.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To understand facets of interactions between the employer and the employees.

CO2. To develop a comprehensive perspective about the legal framework stipulated under the Industrial Democracy.

CO3. To imbibe how to interact, negotiate, and transact with Trade Unions balancing and improving the relations between the employer and the employees.

CO4. To understand the procedure of disciplinary actions as per the Industrial Employment (Standing Orders) Act, 1946.

CO5. To acclimatize with the legal framework stipulated Labor welfare.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
4	1	0

**ADVANCED ACCOUNTING (MC-505)**

**Course Objective:** The primary objective of this subject is to enlighten the students on the theoretical aspects of different topics and special attention to chapters like Inflation accounting, Holding Companies, and Bank and Insurance Company accounts.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Students acquire the knowledge of Accounts of Banking Companies.

CO2. Students will gain knowledge on the preparation of accounts of insurance companies.

CO3. The students will be able to develop knowledge of the holding company concept & preparation of a consolidated balance sheet.

CO4. The student will be able to learn about Inflation accounting and the CPP method.

CO5. Understand about the Human Resource Accounting in India.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
4	1	0

**STRATEGIC FINANCIAL MANAGEMENT (MC-506)**

**Course Objective:** The course aims to lay down the strategic importance of financial management. The course is structured in such a way that the students learn about the classical financial management concepts and also learn problem solving with constraints. The several aspects of financial management are meant to be discussed in details so that the students develop case solving ability in financial management.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Relate the theoretical knowledge of strategic decision making with financial policy and organizational goals.

CO2. Solve practical problems on capital budgeting decisions.

CO3. Understand how a firm determines its capital structure.

CO4. Understand the importance of liquidity in a firm.

CO5. Develop the knowledge about the importance or futility of dividend payment through classical theories.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**STRATEGIC MARKETING MANAGEMENT (MC-507)**

**Course objective:** The course aims to provide students' a holistic understanding and knowledge in strategic marketing and the application of marketing in business and organizational settings and global practices of product development and marketing communication strategies.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Compare and contrast the key principles of marketing strategy.

CO2: Explain marketing and strategy concepts and ideas in their own words.

CO3: Think strategically about marketing issues and provide recommendations.

CO4: Identify market potential and communicate value to customers.

CO5: Prepare a professional, logical and coherent report in the form of a marketing plan.

**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**FUNDAMENTALS OF BUSINESS ANALYTICS (MC-508)**

**Course objective:** This course is designed to equip students with the knowledge and skills needed to business analytics and to bring knowledge about the Decision Making and to know about the approaches in Decision Making.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To define and understand the importance of business analytics and data science in business process and industry.

CO2. the student will be able to understand the Categories of Business Analytical methods and models.

CO3. to understand the Role and Significance of Decision Making.

CO4. the student will be aware of the Modern Approaches in Decision Making and Common Problems in Decision Making.

CO5. the student will be able to know Value of Analytics in Decision Making.



**M. COM. 2<sup>nd</sup> SEMESTER**

L	T	P
3	0	0

**EXPORT AND IMPORT MANAGEMENT (MC-509)**

**Course Objective:** The main aim of this subject to enhance the understanding of the International Trade procedure and Foreign Trade Policy and bring about the awareness regarding the Guidelines of Import Procedure.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the International Trade and Foreign Trade Policy.
- CO2. The student will be able to know the Balance of Payments and FEMA.
- CO3. Understand the Export Procedure and Export Documents.
- CO4. Students will be aware of the Guidelines of Import Procedure.
- CO5. To know Export Pricing, Financing and EXIM Bank.

**M. COM. 2<sup>nd</sup> SEMESTER**

**PERSONALITY PSYCHOLOGY (PSYM 522)**

L	T	P
4	0	0

**Course Objective:** This course's primary goal is to comprehend and apply personality assessment and personality theory applications to a variety of life situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To gain in-depth knowledge about the major theoretical approaches of personality psychology.
- CO2. To enhance the comprehension of the social phenomena involving self and others by underscoring the role of cultural differences.
- CO3. Understand the foundation of Education and personality and the relationship between them.
- CO4. Successfully and proficiently discuss the main aspects, advantages, and disadvantages of theories within personality psychology.
- CO5. Think critically about theoretical and empirical issues within the field of personality psychology.

**M. COM. 3<sup>rd</sup> SEMESTER**

**COMPUTER AND OFFICE MANAGEMENT (CSE-551)**

L	T	P
3	0	1

**Course Objective:** To familiarize the students with the fundamentals of computers and to implement the Principles of Computers in business operations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To make the students understand the basic concepts of Computers and Computer processing.
- CO2. To expand the understanding of languages, MS Office, and MS Excel functions, methods and applications in business.
- CO3. Students will be able to support management in office administration.
- CO4. Learn by doing MS Power Point and MS Word applications in preparing business documents.
- CO5. Students will be able to utilize appropriate office technology. Students will also be able to execute the duties of an office administrator and to know about the role of management in the workplace, levels and functions of management

**M. COM. 3<sup>rd</sup> SEMESTER**

**ENTREPRENEURSHIP & SMALL BUSINESS  
MANAGEMENT (MC-510)**

L	T	P
3	0	0

**Objective:** The basic objective of this course is to develop an understanding of basic concepts in the area of entrepreneurship and also highlight the role and importance of entrepreneurship for economic development.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To be familiarized with the fundamentals of entrepreneurship and its role in economic development and to motivate them towards entrepreneurial activities.

CO2. To understand the concept of entrepreneurial development and how far different institutions have helped in the overall development of Entrepreneurship.

CO3. To understand the concept of entrepreneurial motivation and its applicability to different sectors of the economy for overall development.

CO4. To know the importance of rural entrepreneurship and how rural entrepreneurship can help in the overall economic development of India

CO5. To make students aware about how small business are formed in the light of the legal and regulatory framework in India.

**M. COM. 3<sup>rd</sup> SEMESTER**

**PROJECT MANAGEMENT (MC-511)**

L	T	P
3	1	0

**Objective:** The aim of the course is to enable the student to evolve a suitable framework for the preparation, appraisal, monitoring and control and hedge risk of industrial project. The course would also help to understand the role of financial services in project management and would make its student understand how to mobilise finance for domestic and international projects.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understanding the scope, cost, timing, and quality of the project, at all times focused on project success.

CO2: Analyzing the project appraisal techniques with respect to market & demand analysis, situation analysis, collection of information, demand forecasting and market planning.

CO3: Understanding the technical and financial analysis with respect to a project.

CO4: Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements.

CO5: Understanding the role and responsibilities of the project manager, planning, organizing, controlling, project review and administrative aspect and skills of the project manager.



**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	1	0

**INTERNATIONAL MARKETING (MC-512M)**

**Course Objective:** To familiarize the students with the concept and issues of international marketing and enable them to be able to analyze the foreign market environment and develop international marketing strategies for a business firm.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: To gain know how of diverse theories and concepts related to the International Marketing environment.

CO2: The students will be able to put in use the marketing concepts in realization of organizations goals of going international.

CO3: To make students capable of evaluating the various components of PESTLE analysis and thereof planning the international marketing decisions.

CO4: To justify the use of global marketing practices in leveraging the advantages of international trade.

CO5: To hypothesize an international marketing environment and implement the marketing mix tools to create a marketing campaign.

**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	1	0

**SUPPLY CHAIN AND LOGISTIC MANAGEMENT (MC-513M)**

**Course Objective:** This course is intended to provide an understanding of the components and processes of supply chain and logistics management as well as the performance drivers of supply chain. It is also intended to help the students to learn about logistics, transportation, warehousing and outsourcing decisions.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand how Supply chain is supportive for enhancing business.

CO2: Develop insights into Supply chain management concepts and its impact on Business.

CO3: Demonstrate the importance of Logistics and Technology in SCM.

CO4: Understanding how world class manufacturing is impacting on Indian Markets.

CO5: Impart the understandings of Design for Logistics concepts that are used to control logistics cost and make the supply chain more efficient.

**M. COM. 3<sup>rd</sup> SEMESTER**

L	T	P
3	1	0

**FINANCIAL DERIVATIVES (MC-512F)**

**Course Objective:** The basic objective of this subject is to provide knowledge about various derivatives which are used in financial markets. The course will provide the students an understanding of the inter-linkages and regulatory frame-work within which the system operates in India.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Analyse and price diverse derivatives products to generate an optimal risk management strategy.

CO2: Demonstrate critical thinking, analytical and problem-solving skills in the context of derivatives pricing and hedging practice.

CO3: Explain the binomial model and its extension in continuous time to the Black-Scholes model.

CO4: Demonstrate an understanding of pricing forwards, futures and options contracts

CO5: Be able to describe standard derivative contracts, their properties and functionality, skills and abilities.

**M. COM. 3<sup>rd</sup> SEMESTER**

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**SECURITY ANALYSIS AND PORTFOLIO MANAGEMENT (MC-513F)**

**Course Objective:** The objective of the course is to establish a conceptual framework for the study of security analysis and portfolio management. This course will provide the student the ability to understand and utilise the skill of optimising returns. The focus at different places is to build models and discuss their validity and application to practical situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: Understand the basic structure and working of primary and secondary financial markets in India and conversant with computation of risk and return measures for financial instruments.

CO2: Understand secondary market trading

CO3: Understand and appreciate the Fundamental and Technical analysis tools for analyzing financial securities.

CO4: Well versed with the concept of a Portfolio and understand the principle portfolio theories.

CO5: Acquaint and understand portfolio analysis, portfolio evaluation and portfolio revision techniques.

<b>L</b>	<b>T</b>	<b>P</b>
<b>3</b>	<b>1</b>	<b>0</b>

**M. COM. 3<sup>rd</sup> SEMESTER**

**ECONOMIC AND ACCOUNTING ASPECTS OF HUMAN CAPITAL (MC-512H)**

**Course Objective:** The course provides detailed framework of all aspects on the economics of labour components of intellectual capital and the accounting aspects of Human Capital. It will also provide relevant knowledge to the learners in order to solve specific labour economics problems.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1: To describe theories of wage determination and develop wage policy and wage plans.

CO2: To explain concept and components of intellectual capital along with TRIPS and generate patentable ideas.

CO3: To apply various models of human resource accounting as per decision requirement.

CO4: To link HR metrics to business outcomes using annual reports of companies.

CO5: To link HR scorecard to balanced scorecard.



### M. COM. 3<sup>rd</sup> SEMESTER

#### MANAGEMENT OF INDUSTRIAL RELATIONS (MC-513H)

L	T	P
3	1	0

**Course Objective:** The objective of the course is to make student practically equipped to manage the industrial relations in the light of numerous augmentations in the area of Industrial relations. The course will make them understand the importance of industrial relations for an organization and the ways and means to create industrial harmony at different levels of the organization.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. To understand facets of interactions between the employer and the employees.

CO2. To develop a comprehensive perspective about the legal framework stipulated under the Industrial Democracy.

CO3. To imbibe how to interact, negotiate, and transact with Trade Unions balancing and improving the relations between the employer and the employees.

CO4. To understand the procedure of disciplinary actions as per the Industrial Employment (Standing Orders) Act, 1946.

CO5. To acclimatize with the legal framework stipulated Labor welfare.

### M. COM. 4<sup>th</sup> SEMESTER

#### RISK MANAGEMENT & INSURANCE (MC-514)

L	T	P
3	0	0

**Course Objective:** The course aims to provide a basic understanding of the concept & classification of risk. The student will understand the process of risk management in detail and how insurance acts as a risk management tool.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. Understand the concept of risk and uncertainty and classify risks, and levels of risk, and explain the behavioural aspect of risk and economics of insurance.

CO2. Explain insurable and non-insurable risks.

CO3. Analyze the role of risk management and insurance in economic development and as a social security tool.

CO4. Evaluate the managerial functions of risk management and its process and also the working of insurance.

CO5. Evaluate the insurance contract as a risk management tool.

### M. COM. 4<sup>th</sup> SEMESTER

#### INTELLECTUAL PROPERTY RIGHTS (MC-515)

L	T	P
3	0	0

**Course Objective:** The basic aim of this course to aware the students about the procedure of registration and protection of intellectual property rights such as trademarks, copyrights, patents and designs etc.

#### Course Learning Outcomes:

After completing the course, the student shall be able to:

CO1. The students would understand need, use and application of this act in their research project and activities.

CO2. Understand and introduce Cash amental aspects of intellectual property rights to students who are going to play major role in developing and management of innovative project in industries.

CO3. The students once they complete their academic projects, they get awareness of acquiring the patent.

CO4. To know about how can use copyright for innovative works.

CO5. The students also get the knowledge of plagiarism in their innovations which can be questioned legally.

**M. COM. 4<sup>TH</sup> SEMESTER**

L	T	P
3	0	0

**INDIAN CONSTITUTION AND HUMAN RIGHTS (MC-516)**

**Course Objective:** The course aims to understand the Indian Constitution in relation to human rights. Various provisions in promoting human rights are discussed in the context of India and the extent of its practice and violation.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. The students will have a comprehensive understanding of Indian constitution in relation with Human Rights.
- CO2. The students will understand how the plurality of Indian society is reflected and accommodated in the constitution.
- CO3. Indian constitution in relation to provisions of International human rights will be discussed.
- CO4. The students understand through the case studies the issue of violation of human rights.

**M. COM. 4<sup>TH</sup> SEMESTER**

L	T	P
3	0	0

**RETAIL MANAGEMENT (MC-517M)**

**Course Objective:** The objective of the course is providing insights on retail operations. This will enable the students to become good retail planners and decision makers and help focus on change and adaption to change.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. To make students aware of personal selling and quota management.
- CO2. To make students aware of retail store management concepts and their strategies.
- CO3. To develop student skills in planning for the Location and layout of the store.
- CO4. To make students aware of the merchandise management concepts.
- CO5. To apply knowledge in the marketing planning process, particularly in market segmentation, positioning, and marketing mix development.

**M. COM. 4<sup>TH</sup> SEMESTER**

L	T	P
3	0	0

**MARKETING OF SERVICES (MC-518M)**

**Course Objective:** The course brings out the emerging service environment in India and the world. It emphasises the distinctive aspects of Services Marketing. It aims at equipping students with concepts and techniques that help in taking decisions relating to various services marketing situations.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

- CO1. Understand the Concept of Services and intangible products.
- CO2. Discuss the relevance of the services Industry to Industry.
- CO3. Examine the characteristics of the services industry and the modus operandi.
- CO4. Analyze the role and relevance of Quality in Services.
- CO5. Visualize future changes in the services Industry.



**M. COM. 4<sup>th</sup> SEMESTER**

L	T	P
3	0	0

**INTERNATIONAL FINANCIAL SYSTEM (MC-517F)**

**Course Objective:** The main objective of this course is to provide students with a practical grasp of the global financial system, frequently used financial market instruments, and global financial system regulation.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. Learn how the world's financial markets operate as well as how financial institutions contribute to the economy.

CO2. Apply critical thinking skills to understand the interdependence of the Indian economy with other international economies.

CO3. Show that you understand the governance of the global financial system.

CO4. Acknowledge the International Legal Framework of the International Financial Regulations.

CO5. Analyze the effects of the integration of global financial markets and instruments.

**M. COM. 4<sup>th</sup> SEMESTER**

L	T	P
3	0	0

**TAX PLANNING AND AUDITING (MC-518F)**

**Course Objective:** The purpose of this course is to familiarize and update the students with the basic principles of taxation in the Indian economy.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To familiar with the computation of income from other sources.

CO2. To know about the aggregation of income and deduction u/s 80C to 80U.

CO3. To aware about the income tax authorities and their powers and duties.

CO4. To understand more about government audit, audit of charitable and educational organizations, hospitals, clubs etc.

CO5. To acquaint themselves about the concepts and principles of auditing, auditing process and the objectives of auditing.

**M. COM. 4<sup>th</sup> SEMESTER**

L	T	P
3	0	0

**EMPLOYEE COMPENSATION MANAGEMENT AND WELFARE (MC-517H)**

**Course Objective:** The course is designed to promote understanding of issues related to compensation management in the corporate sector and public services and to impart skill in designing compensation management systems, policies, and strategies, apart from promoting understanding of legal issues in the administration of compensation, welfare and social security.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To acquaint with the basic legal framework envisaged under the statutes for compensation and welfare of employees in different modes.

CO2. To understand the principles involved and premise of the grant of bonus, wages, and minimum wages to workers.

CO3. To be well versed with working in the maintenance and compliance vertical of compensation structuring department.

CO4. To handle the organizations scenarios having large scale variation of minimum wages both within the country and internationally.

CO5. To have insights about the employment benefits for women envisaged.

**M. COM. 4<sup>th</sup> SEMESTER**

**HUMAN RESOURCE DEVELOPMENT (MC-518H)**

<b>L</b>	<b>T</b>	<b>P</b>
<b>4</b>	<b>0</b>	<b>0</b>

**Course Objective:** The objective of this course is to make student aware of the concepts, techniques and practices of Human Resource Development (HRD) through assessment of theories and practices of HRD. This course is intended to make students capable of applying the principles and techniques as professionals for developing human resources in an organization.

**Course Learning Outcomes:**

After completing the course, the student shall be able to:

CO1. To build an understanding and perspective of Human Resource Development as discipline appreciating learning.

CO2. To learn the skills of developing a detailed plan for need and implementation of HRD program in the organization.

CO3. To learn role of learning in action as an individual, group and an organization in order to develop creative strategies to organizational problems.

CO4. To develop a perspective of HRD beyond organizational realities including national HRD.

CO5. To understand contemporary realities of HRD and its interface with technology.



## **MASTER OF BUSINESS ADMINISTRATION in BUSINESS ANALYTICS**

### **PROGRAMME OUTCOMES (POs)**

On completing the programme students will be able to:

**PO1:** Reveal an understanding of management concepts, principles and theories, and in turn apply them in the organizational work practices.

**PO2:** Apply analytical and critical thinking skills to the dynamic business environment and identify entrepreneurial and business opportunities and risks.

**PO3:** Prepare business strategies, develop functional and operational strategies and implement them in an integrated manner to achieve the functional goals and the business objectives.

**PO4:** Demonstrate an understanding of data-driven decision-making processes at various levels of the organization with respect to resources mobilization and their efficient deployment.

**PO5:** Demonstrate the ability to analyse managerial problems, to identify and collect relevant data and to apply data-based problem-solving approach.

**PO6:** Identify and recommend the information technology-based interventions to achieve organizational goals.

**PO7:** Benchmark organizational practices against the principles of good governance, ethical conduct, and corporate social responsibility for long-term societal welfare.

**PO8:** Demonstrate effective communication and interpersonal skills as well as the ability to work with and lead teams.

## **MBABA 501: FUNDAMENTALS OF PYTHON-I**

### **Course Learning Outcomes:**

1. Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
2. Express proficiency in the handling of strings and functions.
3. Implement Conditionals and Loops for Python Programs.
4. Use functions and represent Compound data using Lists, Tuples and Dictionaries.
5. Identify the commonly used operations involving file systems and regular expressions.

## **MBABA 502: STATISTICAL FOUNDATIONS FOR DATA SCIENCE**

### **Course Learning Outcomes:**

1. Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis.
2. Critically evaluate the underlying assumptions of analysis tools.
3. Understand and critically discuss the issues surrounding sampling and significance.
4. Discuss critically the uses and limitations of statistical analysis.
5. Conduct basic statistical analysis of data.

## **MBABA 503: MANAGERIAL ECONOMICS**

### **Course Learning Outcomes:**

1. Develop tools useful for business decision making
2. Detailed examination of production, revenue, and cost analysis.
3. Examine different market structures and performance
4. Consider business problems from an economic perspective
5. Examine uncertainty in the market and consumer behavior and investment analysis.

## **MBABA 504: ORGANISATIONAL BEHAVIOR AND HUMAN RESOURCE MANAGEMENT**

### **Course Learning Outcomes:**

1. To introduce the basic concepts, functions and processes of organizational behavior.
2. To create an awareness of the role, functions and functioning of human resource department of the organizations.
3. To develop the understanding of the concept of human resource management and to understand its relevance in organizations.
4. To develop necessary skill set for application of various HR issues.
5. To analyse the strategic issues and strategies required to select and develop manpower resources.

## **MBABA 505: DATABASE MANAGEMENT - I**

### **Course Learning Outcomes:**

1. To understand the fundamental concepts of database management that include aspects of database design, database languages, and database-system implementation.
2. To analyze businesses cases and apply the concepts of relational database and convert that business case into an Entity Relationship Diagram and eventually create a relational database.
3. To be able to write advanced SQL statements.
4. To understand the technical aspects such as indexes, triggers, concurrency control, transactions. that support the underlying DBMS and learn how to apply those concepts in a relational database.
5. To Understand basic concepts of XML and implementing XML databases.



## **MBABA 506: SOFT SKILLS & PERSONALITY DEVELOPMENT-I**

Soft Skills & Personality Development programme will enable students to develop effective communication skills (spoken and written) and presentation skills. It will also help students to understand how to conduct effective business correspondence and prepare business reports.

It aims to develop and improve qualities such as communication skills, confidence, emotional intelligence, self-awareness, leadership abilities, interpersonal skills, and overall personal effectiveness.

## **MBABA 507: FOUNDATIONS OF ACCOUNTING-I**

### **Course Learning Outcomes:**

1. To understand the basic concepts and principles of accounting in business transactions.
2. To understand the fundamental cost analysis principles, classification of costing at various stages.
3. To familiarize with the preparation and analysis of financial statements.
4. To gain insight into the budget and budgetary control measures and its application.
5. To enable students to make use of accounting information for decision making and control.
6. Understanding the human resource accounting and transfer pricing.

## **MBABA 508: MACROECONOMICS AND POLICY ANALYSIS**

### **Course Learning Outcomes:**

1. To draw out the relationship between crucial macroeconomic variables.
2. To understand how the external factors and policy issues affect the operation of an economy and why managers need to understand the dynamics of the economy at firm level.
3. To familiarize with government policy measures in regulating and planning for the economy.
4. To gain fundamental knowledge of the macro economy on the basis of which policy decisions can be analyzed and business decisions can be made.
5. To understand the determinants of national income in the economy from different perspective.
6. Understanding the impact of fiscal & monetary policy in product market and money market.

## **MBABA 509: FUNDAMENTALS OF PYTHON-II**

### **Course Learning Outcomes:**

1. To understand basics of Python and NumPy array, array reshape and array indexing
2. To understand the normal distribution, binomial distribution and Numpyufunc.
3. To familiarize with pandas plotting, data visualization with matplotlib, panda's correlations.
4. To understand the data structure, data frames and Pandas Idioms.
5. To understand the pyplot plotting, markets lines, labels, grid, subplots and scatter plots, bars, histograms and pie charts.

## **MBABA 510: DATA ANALYSIS USING SPREADSHEETS**

### **Course Learning Outcomes:**

1. Demonstrate Work in Excel Environment
2. Navigate, Select, and Edit cells in Worksheet
3. Utilize Format Excel Worksheets
4. Develop Compute using Excel Formula and Excel functions
5. Create Graphs, Charts, and Tables
6. Search, Sort, Filter Data
7. Summarize Data through Frequency distributions and the measures of Central tendency and dispersion

## **MBABA 511: FOUNDATIONS OF MARKETING MANAGEMENT**

### **Course Learning Outcomes:**

1. To understand marketing concepts, tools, and methods of analysis in private and public organizations.
2. To familiarize with practical, managerial approach to managing the marketing process.
3. To understand the steps in the marketing process, including market research, segmentation, targeting, positioning, the four P's (product, place, price, promotion).
4. To gain insight in customer value and satisfaction, competitive analysis, brand strategy, consumer behavior, advertising, and the impact of the internet on marketing strategy and implementation.
5. To enable students for understanding the science behind marketing and how it connects to business outcomes.

## **MBABA 512: FOUNDATIONS OF ACCOUNTING-II**

### **Course Learning Outcomes:**

1. To understand the basic concepts and principles of accounting in business transactions.
2. To understand the preparation of financial statement & balance sheet, its types, objectives, role and significance in business world.
3. Understanding the links between the financial statements, understanding circularity, setting up and formatting the model.
4. To gain insight the importance of valuation, understanding enterprise value and equity value.
5. To enable students to make the discounted cash flow analysis including forecasting terminal value, present value and discounting value.
6. Understanding weighted average cost of capital using the CAPM to estimate the cost of equity and estimating the cost of debt.



## **MBABA 513: FOUNDATIONS OF MODERN FINANCE-I**

### **Course Learning Outcomes:**

- 1.To develop an understanding of the basic concept of finance, its types, valuation of assets and decision-making.
- 2.To gain knowledge about the financial market, investing & financing decisions based upon the time value of money concepts.
- 3.To know the concept of cost of capital and compare the different types of cost.
- 4.To acquaint students with the theoretical and practical aspects of capital budgeting and portfolio management.
- 5.Togiveanexposureofanalyzingtheavailableinvestmentoptionsforinvestmentthroughdifferent theories and models.

## **MBABA 514: OPERATIONS RESEARCH**

### **Course Learning Outcomes:**

1. Understand the basic concept of operation research and identify and develop operational research models from the verbal description of the real system.
2. Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.
3. Understand the mathematical tools that are needed to solve optimization problems.
- 4.Use CPM and PERT techniques, to plan, schedule, and control project activities.
- 5.Construct the transportation model and analyze the game theory.
- 6.Use some solution methods for solving the linear optimization problems.

## **MBABA 515: FUNDAMENTALS OF PYTHON-III**

### **Course Learning Outcomes:**

1. Understanding the students with the concept of inheritance and its various types in Python.
2. Understand the concept of polymorphism and its types in python.
3. To introduce the concept of abstraction and its importance in python programming.
4. To familiarize with the method of achieving abstraction in python using abstract classes and concrete methods.
5. Explain the concept of encapsulation and method of achieving encapsulation in Python programming.

## **MBABA 516: BUSINESS RESEARCH METHODS**

### **Course Learning Outcomes:**

1. At the end of the course, students will be able to learn about the research process, tools and techniques in order to apply for managerial decision making.
2. Students will learn to apply research tools to conduct research and analysis of data for different management areas. They will learn to apply statistical tool like SPSS and have understanding of other statistical softwares for analysis of research data.

## **MBABA 517: DATABASE MANAGEMENT - II**

### **Course Learning Outcomes:**

1. Analyze and optimize complex database queries for performance.
2. Design and implement advanced database schemas to handle complex data relationships.
3. Apply database security principles to protect sensitive data.
4. Develop skills in managing and maintaining large-scale databases.
5. Utilize emerging trends and technologies in the database field.
6. Create database-driven web applications.

## **MBABA 518: SOFT SKILLS & PERSONALITY DEVELOPMENT-II**

Soft Skills & Personality Development programme will enable students to enrich their communication skills. It will also help students for:

- Professional behavioural etiquettes
- Understanding about Customer Relationship Management
- Leadership Skills
- Innovation and Creativity.

Through this programme students will learn how to build relationships with coworkers and customers, which promotes cooperation and communication within the workplace and trust among colleagues, clients and customers.

## **MBABA 519: FOUNDATIONS OF E-COMMERCE**

### **Course Learning Outcomes:**

1. Develop understanding about web technologies that enable E-commerce.
2. Understand the different mechanism of E-commerce initiatives like B2C and B2B
3. Develop understanding about the various security and fraud issues associated with e-commerce
4. Understand basic concept of mobile commerce and the internet of things.

## **MBABA 520: FOUNDATIONS OF MODERN FINANCE-II**

### **Course Learning Outcomes:**

1. Develop a comprehensive understanding of the stock market and investment analysis.
2. Understand the fundamentals and features of technical analysis and its use in trading.
3. Develop understanding about dynamic investment appraisal, risk-return models, and calculations of return and risk for different securities.
4. Develop analytical skills to understand different types of charts and candlestick and patterns for stock analysis.



## **MBABA 521: FOUNDATIONS OF MACHINE LEARNING**

### **Course Learning Outcomes:**

1. To familiarize the students with practical applications of machine learning in various fields, such as healthcare, finance, and marketing.
2. To enable the students to apply machine learning techniques to real-world problems, making them valuable assets in the industry.
3. Develop the knowledge and skills to design, and implement machine learning models using different algorithms, as well as evaluate and interpret the performance of these models

## **MBABA 522: CYBER SECURITY**

### **Course Learning Outcomes:**

1. This course enables students with a fundamental understanding of cybersecurity concepts, strategies, and best practices.
2. Students will learn how to protect data, systems and organizations from common cybersecurity threats and develop the skills necessary to make informed decisions regarding cybersecurity in a business analytics context.

## **MBABA 523: COVARIANCE BASED STATISTICAL METHODS**

### **Course Learning Outcomes:**

1. Understand the basic concept of Research Process Handshake with SPSS and Data Editor from the verbal description of the real system.
2. Classification of Correlation and regression of variables and relation of its coefficients.
3. Understand the mathematical tools that are needed to Hypothesis Testing.
4. Understand Comparing Two and Several Means with ANOVA.
5. Understand Pearson's correlation coefficient and Spearman's correlation coefficient.
6. Applications and Statistics associated with Factor Analysis, Procedure of Discovering Factors and Reliability Analysis.

## **MBABA 524: DATA VISUALIZATION USING POWER BI**

### **Course Learning Outcomes:**

1. Understand the importance of data visualization in business analytics and decision-making processes.
2. Learn the fundamentals of data visualization, including visual perception, design principles, and storytelling techniques.
3. Gain proficiency in using Power BI software for data exploration, transformation, and visualization.
4. Acquire knowledge of different types of visualizations and when to use them appropriately.
5. Develop skills in creating interactive dashboards and reports for effective data communication.
6. Explore advanced features of Power BI, such as calculations, parameters, and blending data sources.
7. Apply data visualization techniques to analyze real-world business scenarios and draw actionable insights.

## **MBABA 525: DATA MINING AND WAREHOUSING**

### **Course Learning Outcomes:**

1. Understand basic concepts and techniques of data mining
2. Understand different techniques and steps of data pre-processing
3. Understand and gain practical experiences in knowledge discovery process models.
4. Gain practical experience in building different DM modeling techniques using available machine learning algorithms in DM
5. Gain practical experience on how to evaluate the performance of data mining models
6. Develop skills in using data mining software for solving practical problems
7. Gain experience in doing independent study and research using data sciences like data mining.

## **MBABA 526: BUSINESS STRATEGY**

### **Course Learning Outcomes:**

1. The students will learn how to use data analytics for strategic decision-making, including big data and machine learning, predictive analytics, and forecasting.
2. Develop solid understanding of business strategy among students and can apply their knowledge and skills to real-world business situations.
3. Prepare strategy evaluation and how to measure performance and improve organizational effectiveness.
4. By the end of the course, students will have a solid understanding of strategic management and the tools and techniques used to develop and implement effective business strategies.



## **MBABA 527: PRINCIPLES OF PREDICTIVE ANALYTICS**

### **Course Learning Outcomes:**

1. To understand a comprehensive introduction to predictive analytics using the PLS-SEM approach
2. To familiarize with the nature of causal modeling, analytical objectives, and statistics.
3. To understand the theoretical foundation PLS-SEM evaluation of measurement and structural predictive models.
4. To enable students for using Qualtrics to develop a survey for the predictive analysis research.
5. To run bootstrapping algorithms to evaluate the validity of the structural model using the Smart PLS3tool.

## **MBABA 528: ECONOMETRICS-I**

### **Course Learning Outcomes:**

1. Familiarizing students in depth about applications of econometric methods concerning various business activities in the domain area of a business organization.
2. The students will be in a strong position to analyze data for various purposes including policy analysis, carryout empirical work and enhance their job market skills.
3. Carrying out econometric applications on functional issues using real-time data to solve various decision problems using econometric software.
4. The course will emphasize on theoretical underpinnings and practical applications of econometrics techniques supplemented by computer work.

## **MBABA 529: SOFT SKILLS & PERSONALITY DEVELOPMENT-III**

Soft Skills & Personality Development programme will play crucial role to prepare their resumes in effective way. It will help students to enhance communication skills.

It aims to develop business etiquettes and professional behavior. Also, emphasis will be given on Body Language and right posture etc.

## **MBABA 530: MARKETING ANALYTICS**

### **Course Learning Outcomes:**

1. Understand the role of marketing analytics in strategic decision-making and its importance in business analytics.
2. Demonstrate proficiency in using marketing analytics tools and software for data analysis and interpretation.
3. Apply descriptive analytics techniques to gain insights into customer behavior, segmentation, and market trends.
4. Utilize predictive analytics models to forecast customer behavior, identify potential opportunities, and mitigate risks.
5. Analyze digital marketing data, including web analytics, social media metrics, and search engine optimization (SEO) data.
6. Develop skills in measuring marketing performance, defining key performance indicators (KPIs), and creating effective marketing dashboards.

## **MBABA 531: INVESTMENT AND PORTFOLIO MANAGEMENT**

### **Course Learning Outcomes:**

1. Explain the investment environment and concept of return & risk.
2. Understand bond valuation and Portfolio performance evaluation.
3. Examine equity approaches.
4. Analyze two securities portfolios using Quantitative models and Portfolio Rebalancing and Optimization.
5. Evaluate investor's protection framework.

## **MBABA 532: SUPPLY CHAIN MANAGEMENT**

### **Course Learning Outcomes:**

1. Students will learn how to model and analyze supply chain systems using quantitative techniques and optimization methods.
2. They will gain proficiency in using mathematical models to optimize supply chain operations, such as inventory management, demand forecasting, production planning, and distribution network design.
3. Students will be able to identify, analyze, and mitigate risks within the supply chain. They will learn techniques for risk assessment, risk mitigation, and developing contingency plans. Students will understand the importance of supply chain resilience and the impact of disruptions on overall supply chain performance.



## **MBABA 533: ECONOMETRICS II**

### **Course Learning Outcomes:**

1. Familiarizing students in depth about applications of econometric methods concerning various business activities in the domain area of a business organization.
2. The students will be in a strong position to analyze data for various purposes including policy analysis, carryout empirical work and enhance their job market skills.
3. Carrying out econometric applications on functional issues using real-time data to solve various decision problems using econometric software.
4. The course will emphasize on theoretical underpinnings and practical applications of econometrics techniques supplemented by computer work.

## **MBABA 534: CORPORATE LEGAL ENVIRONMENT**

### **Course Learning Outcomes:**

1. Given the circumstances, the learner will be able to infer legal aspects of doing business & plan business activities. In a given situation, the learner will be able make use of provisions of the Contract Act to evaluate a contract used in commercial practice.
2. In a given situation, learner will be able to distinguish between various types of Companies and explain their comparative advantages and disadvantages. The learner will be able to explain the legal process involved in formation of a company and understand the relationships amongst the various stakeholders of the company.
3. Under the given scenario, the learner will be able to describe various provisions of IT Act and will be able to use various provisions of Sale of Goods Act & Negotiable Instrument Act.
4. A learner will be able to analyze the elements of Social, political, economic environment around a firm.

## **MBABA 535: IT STRATEGY**

### **Course Learning Outcomes:**

1. Gain a thorough understanding of the role that information systems and information technology play in modern organizations.
2. Understand how information technology is being used in real-life situations by organizations to redefine their competitive boundaries.
3. Acquire an understanding of the business process view of information systems and systems development lifecycle.
4. Acquire a thorough understanding of issues in the effective management of modern information systems.

## **MBABA 536: PROJECT MANAGEMENT**

### **Course Learning Outcomes:**

1. Students will be able to initiate and plan a project effectively. They will demonstrate the ability to define project goals and objectives, identify stakeholders, create project charters, develop comprehensive project plans, and estimate project costs and timelines.
2. Students will develop skills in identifying, assessing, and managing project risks. They will be able to apply risk management techniques, develop risk response plans, and monitor and control risks to minimize their impact on project success.
3. Students will gain an understanding of the ethical considerations and professional responsibilities associated with project management. They will demonstrate knowledge of ethical principles, codes of conduct, social responsibility, sustainability, and legal aspects relevant to project management.

## **MBABA 537: ECONOMETRICS III**

### **Course Learning Outcomes:**

1. Familiarizing students in depth about applications of econometric methods concerning various business activities in the domain area of a business organization.
2. The students will be in a strong position to analyze data for various purposes including policy analysis, carry out empirical work and enhance their job market skills.
3. Carrying out econometric applications on functional issues using real-time data to solve various decision problems using econometric software.
4. The course will emphasize on theoretical underpinnings and practical applications of econometrics techniques supplemented by computer work.



## **MBABA 538: SOFT SKILLS & PERSONALITY DEVELOPMENT-IV**

**L/T/P: 0/0/1**

Soft Skills & Personality Development programme will enable students to enrich their presentation skills.

It will also help to prepare students for Placement Interviews by giving interview tips and practicing for the same through Mock Interviews.

## **MBABA 539: DISRUPTIVE INNOVATIONS & MANAGEMENT**

### **Course Learning Outcomes:**

1. Students will develop the ability to identify and analyze disruptive trends in technology. They will be able to evaluate emerging technologies and assess their potential to disrupt existing markets, business models, and industry dynamics.
2. Students will learn how organizations can develop strategic responses to disruptive technologies. They will be able to formulate and evaluate different strategies, such as building innovation capabilities, partnerships, acquisitions, or internal innovation labs, to respond effectively to disruptive forces.
3. Students will gain awareness of the ethical and social implications of disruptive technologies. They will analyze the impact of disruptive technologies on privacy, employment, equity, and other societal factors. Students will develop an understanding of responsible approaches to navigating the challenges posed by disruptive technologies.

## **MBABA 540: BIG DATA TECHNOLOGIES**

### **Course Learning Outcomes:**

1. Students will develop a comprehensive understanding of the fundamental concepts and characteristics of big data, including volume, velocity, variety, and veracity. They will grasp the challenges and opportunities presented by big data in various domains.
2. Students will learn techniques for ingesting and integrating large volumes of diverse data into big data systems. They will explore methods for extracting data from various sources, such as databases, sensors, social media, and logs, and understand how to transform and load data into big data platforms.
3. Students will learn how to effectively visualize and communicate insights derived from big data. They will explore visualization techniques and tools that facilitate the exploration and interpretation of large-scale datasets, enabling stakeholders to make informed decisions.
4. Students will be aware of the security and privacy challenges in big data environments. They will understand data governance, access control, and encryption techniques to ensure the confidentiality, integrity, and privacy of big data.

## **MBABA 541: ADVERTISING & SALES MANAGEMENT**

### **Course Learning Outcomes:**

1. This course will help students learn the fundamentals of advertising & its strategies.
2. The course will introduce students to concepts of Media Planning, Media planning and measuring effectiveness of different media.
3. The objective of this course is to give the student an insight towards the various underlying dimensions and challenges of the concept of Integrated Marketing Communication (IMC).
4. The concept will be extensively discussed with individual promotional elements such as public relations, sponsorship, direct marketing, and personal selling with special emphasis on Advertising and Sales Promotion.

## **MBABA 542: BUSINESS ETHICS & VALUES**

### **Course Learning Outcomes:**

1. The student will demonstrate knowledge of the application of ethics in business by Understanding how including ethics as a part of business decision making at all levels of work and management makes a difference
2. The student will analyze and differentiate between honest and transparent versus deceptive or misleading business practices by Understanding how to solve ethical dilemmas through choices that lead to legal, responsible and ethical decisions such that the companies do “the right thing”
3. The student will acquire the ability to incorporate ethical behaviors in supervision and management capacities by understanding how organizational values and corporate cultural values could influence a supervisor or manager to act ethically and by analyzing how personal values, cultural influences, and political considerations could influence a supervisor or manager in each department to act ethically or unethically.
4. The student will explore the ethical complexities facing businesses that operate internationally by understanding the complexities of conducting international business and its possible conflicts with established ethical standards.



## **Programme: B.Com. (Hons.) (Three-year degree programme)**

### **PROGRAMME OUTCOMES (Pos, PSOs & COs)**

**PO1:** Gain a thorough grounding in the fundamentals in different areas of business, Commerce and Finance.

**PO2:** Develop the skill of applying concepts and techniques used in Commerce.

**PO3:** Apply ethical principles in business, commerce and technology.

**PO4:** Effectively communicate in business, commerce and technological environment.

**PO5:** Develop an attitude to perform effectively and efficiently as a leader as well as a member of a team in a business environment.

**PO6:** Ability to engage in lifelong learning.

**PO7:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.

**PO8:** Exposure about entrepreneurship.

**PO9:** Enabling student to be capable of making decisions at personal and professional level.

**PO10:** Getting prepared for post graduate studies and to achieve success in their professional careers.

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO1:** Students will be able to develop and demonstrate knowledge and skills to prepare accounts of corporate sectors and also the knowledge in current issues in the area of computerized set of accounting.

**PSO2:** Students also acquire skills to work as tax consultant, audit assistant and other financial supporting services.

**PSO3:** Students will be able to play roles of businessmen, entrepreneur, managers, consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision making.

**PSO4:** Students will learn relevant managerial accounting career skills, applying both quantitative and qualitative knowledge to their future careers in business.

**PSO5:** Students will be able to develop and demonstrate knowledge of statistical tools used in business analysis.

**PSO6:** Students will gain thorough systematic and subject skills within various disciplines of commerce, business, accounting, economics, finance, auditing and marketing.

**PSO7:** Learners will be able to recognize features and roles of businessmen, entrepreneur, managers, consultant, which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical decision- making.

**PSO8:** Learners will acquire the skills like effective communication, decision- making, problem solving in day to day business affairs.

**PSO9:** Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposure.

**PSO10:** Learners can also acquire practical skills to work as tax consultant, audit assistant and other financial supporting services.

Course	Course Outcomes (COs)
<b>B. Com. (Hons.) 1<sup>st</sup> Sem.</b>	
<b>Business Regulatory Framework (BC-101)</b>	<b>CO1:</b> Identify the essential elements of the legal system including the main sources of law. <b>CO2:</b> The student should know manage the companies in crisis by learning legal implications. <b>CO3:</b> Equip the students about the legitimate rights and obligations under the Sale of Goods Act. <b>CO4:</b> Understand basic aspects of contracts for making the agreements, contracts and subsequently enter valid business propositions.
<b>Financial Accounting (BC-102)</b>	<b>CO1:</b> Understand the theoretical framework of accounting and to prepare financial statements. <b>CO2:</b> Demonstrate the use of double-entry and accounting systems, record transactions and events. <b>CO3:</b> Develop the skill of preparation of trading and profit and loss account and balance sheet using computerized accounting. <b>CO4:</b> Prepare bank reconciliation statement and to identify and rectify errors.
<b>Business Organization and Management (BC-103)</b>	<b>CO1:</b> Learn business activities to compete in competitive world. <b>CO2:</b> Understand entrepreneurship from local to international perspective. <b>CO3:</b> Evaluate the application of functional areas of business activity. <b>CO4:</b> Analyze decision- making and communication.



	<b>CO5:</b> Evaluate the impact of legal, social, and economic environment on business
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<b>Essentials of E-Commerce (BC-104)</b>	<b>CO1:</b> Understand the basics of e-commerce, current and emerging business models. <b>CO2:</b> Familiarize with basic business operations such as sales, marketing, HR etc. on the web. <b>CO3:</b> Enhance the students' skills for designing and developing website. <b>CO4:</b> Identify the emerging modes of e-payment. <b>CO5:</b> Understand the importance of security, privacy, ethical and legal issues of e-commerce.
<b>B. Com. (Hons.) 2<sup>nd</sup> Sem.</b>	
<b>Cost Accounting (BC-105)</b>	<b>CO1:</b> Understand thoroughly the conceptual framework of cost accounting; identification of differences between different financial and cost accounting; cost concepts and elements of cost; preparation of cost sheet. <b>CO2:</b> Outline the procedure for purchase of material, storing and issue of materials and valuation of materials. <b>CO3:</b> Calculate earnings of Workers under different methods. <b>CO4:</b> Choose basis for allocation and apportionment factory indirect costs and absorption of overheads.
<b>Business Environment (BC-106)</b>	<b>CO1:</b> Understand the purpose and types of businesses and how they interact with key stakeholders and the external environment. <b>CO2:</b> Understand the importance of person effectiveness as the basis for effective team and organizational behavior. <b>CO3:</b> Recognize the mechanism of business and finance in the light of professional ethics and values.
<b>Business Economics (ECON-110)</b>	<b>CO1:</b> Ability to understand the concepts of economics and their use in price determination. <b>CO2:</b> Understanding the economic dimensions and perspectives applicable to business entities.
<b>B. Com. (Hons.) 3<sup>rd</sup> Sem.</b>	
<b>Corporate Accounting (BC-201)</b>	<b>CO1:</b> Application of the provisions of Companies Act for issue, forfeiture and reissue of shares. <b>CO2:</b> Develop an understanding of accounting for share capital and debentures. <b>CO3:</b> Competency of preparing financial statements of a company. <b>CO4:</b> Develop an understanding and skill of preparing cash flow statements. <b>CO5:</b> Prepare consolidated balance sheet for Holding company.

<b>Fund Based Financial Services (BC-202)</b>	<b>CO1:</b> Understand the meaning and scope of financial markets as well as institutions in India. <b>CO2:</b> Understand the concepts of venture capital funds. <b>CO3:</b> Explain underwriting of capital issues and trends in underwriting in India. <b>CO4:</b> Explain concept of leasing and factoring. <b>CO5:</b> Examine the financial services industry.
<b>Company Law (BC-203)</b>	<b>CO1:</b> Understand the regulatory aspects and procedural steps of Companies Act & Rules, 2013. <b>CO2:</b> Compare and contrast Memorandum of Association (MoA) and Articles of Association. <b>CO3:</b> Description of powers and duties of company directors and procedures for convening statutory and other meetings. <b>CO4:</b> Understanding circumstances and the procedure for winding up of the company. <b>CO5:</b> Follow the basic legal documents and their usage essential for operations and management of company.
<b>Principles of Marketing (BC-204)</b>	<b>CO1:</b> Develop understanding of basic concepts of marketing, marketing philosophies and environmental conditions effecting marketing decisions of a firm. <b>CO2:</b> Understand the dynamics of consumer behavior and process of market selection through STP stages and marketing segmentation. <b>CO3:</b> Understand and analyze the process of value creation through marketing decisions involving product development. <b>CO4:</b> Understand and analyze the process of value creation through marketing decisions involving product pricing and its distribution. <b>CO5:</b> Understand and analyze the process of value creation through marketing decisions involving product promotion.
<b>Human Resource Management (BC-205)</b>	<b>CO1:</b> Understand basic nature and importance of human resource management in an organization. <b>CO2:</b> Understand different tools used in forecasting and planning human resource needs. <b>CO3:</b> Demonstrate the ability to prepare a selection strategy for a specific job. <b>CO4:</b> Realize the importance of performance management system in enhancing employee performance. <b>CO5:</b> Understand modern HRM to meet the challenges of changing business environment.



<b>International Business (BC-206)</b>	<p><b>CO1:</b> Understand the process of evolution and growth of international business under changing dynamics of the diverse international business environment.</p> <p><b>CO2:</b> Analyze the theoretical dimensions of international trade and intervention measures adopted in the context of Balance of payment account and its components.</p> <p><b>CO3:</b> Understand the significance and role played by various international economic organizations such as the WTO, UNCTAD, IMF and World Bank.</p> <p><b>CO4:</b> Familiarizing with the basic features of the foreign exchange market.</p> <p><b>CO5:</b> Critically examine the concept, form and issues of foreign direct investment.</p>
<b>B. Com. (Hons.) 4<sup>th</sup>Sem.</b>	
<b>Management Accounting (BC-207)</b>	<p><b>CO1:</b> Understand the conceptual framework of Management Accounting.</p> <p><b>CO2:</b> Understand the concept of marginal cost and marginal revenue.</p> <p><b>CO3:</b> Preparation of income statements using absorption and variable costing.</p> <p><b>CO4:</b> Learning of cost-volume-profit analysis and break-even analysis using mathematical and graphical approaches.</p> <p><b>CO5:</b> Understand budgetary control system as a tool of managerial planning.</p> <p><b>CO6:</b> Understand management accounting issues of responsibility accounting, divisional performance measurement and transfer pricing.</p> <p><b>CO7:</b> Understand the concept of relevant and irrelevant costs and make decisions related to different business situations.</p>
<b>Fundamentals of Investment &amp; Stock Market (BC-208)</b>	<p><b>CO1:</b> Learn the basics of investing in stock market, the investment environment as well as risk &amp; return.</p> <p><b>CO2:</b> Understand bond valuation &amp; role of credit rating agencies.</p> <p><b>CO3:</b> Outline role of Mutual Funds in capital market development.</p> <p><b>CO4:</b> Analyze two securities portfolio using Harry Markowitz model, Calculating portfolio risk and return.</p> <p><b>CO5:</b> Explaining CAPM and evaluating Mutual Funds and Financial derivatives.</p> <p><b>CO 6:</b> Explain role of stock exchanges in India.</p>
<b>Workshop on E-Accounting and E-filing of Returns (BC-209)</b>	<p><b>CO1:</b> Understand the concept of e-Accounting, creation and designing of groups, vouchers and accounts.</p> <p><b>CO2:</b> Explain database design for accounting and documenting transactions using vouchers.</p> <p><b>CO3:</b> Decomposing Accounting reports to appreciate information content.</p> <p><b>CO4:</b> Creating data table defining relationships and constraints. Designing accounting vouchers &amp; reports.</p> <p><b>CO5:</b> Conceptual framework of E-Filing of returns income tax and Efiling of ITRs.</p>

<p><b>Financial Management (BC-210)</b></p>	<p><b>CO1:</b> Understanding the role and purpose of the financial management function and its impact on economic environment.</p> <p><b>CO2:</b> Knowing the nature and scope of financial management as well as time value of money and risk return trade off.</p> <p><b>CO3:</b> Estimation of various capital structure theories and factors affecting capital structure decisions in a firm.</p> <p><b>CO4:</b> Critical examination of theories of dividend and factors affecting dividend policy.</p> <p><b>CO5:</b> Computation of working capital requirement.</p>
<p><b>Indian Financial System (BC-211)</b></p>	<p><b>CO1:</b> Understanding the role of financial system in economic development of a nation.</p> <p><b>CO2:</b> To learn about Indian financial markets, regulators of financial markets, financial institutions.</p> <p><b>CO3:</b> Getting enhanced knowledge of financial services in India.</p> <p><b>CO4:</b> Understanding the working procedures of financial institutions and mutual funds role in capital market, Non-banking Financial Companies (NBFCs).</p> <p><b>CO5:</b> Description of conceptual framework of financial services and financial institutions in India.</p>

<p><b>B. Com. (Hons.) 5<sup>th</sup>Sem.</b></p>	
<p><b>Financial Reporting and Analysis (BC-301)</b></p>	<p><b>CO1:</b> Describing conceptual framework of financial reporting in the context of financial statements.</p> <p><b>CO2:</b> Learning reporting of transactions in accordance with international accounting standards.</p> <p><b>CO3:</b> Analysis and interpretation of a case of financial statements of companies.</p> <p><b>CO4:</b> Knowledge of preparation and presentation of financial accordance with international accounting.</p> <p><b>CO5:</b> Understanding of emerging areas in financial reporting - Accounting for E-commerce business, value added statements and integrated reporting.</p>
<p><b>Income Tax (BC-302)</b></p>	<p><b>CO1:</b> Understanding basic concepts in the law of income tax and determine the residential status of different persons.</p> <p><b>CO2:</b> Identifying heads of income of 'Salaries' and 'Income from House Property'.</p> <p><b>CO3:</b> Perfection in computation of income under the head 'Profits and gains of business or profession', 'Capital gains' and 'Income from other sources.</p> <p><b>CO4:</b> Understand clubbing provisions, aggregate income after set-off and carry forward of losses.</p> <p><b>CO5:</b> Computation of taxable income and tax liability of individuals and firms.</p> <p><b>CO6:</b> Developing skills to file online returns of income.</p>



<p align="center"><b>Foreign Exchange Management (BC-303)</b></p>	<p><b>CO1:</b> Understand the international monetary system of Bimetallism, Gold standard, Bretton Woods's system, exchange rate, etc.</p> <p><b>CO2:</b> Regulation and management of foreign exchange. Determination of Exchange Rates.</p> <p><b>CO3:</b> Description of Foreign Exchange Markets and Forward Market.</p> <p><b>CO4:</b> Methods and mechanism of current account transactions, capital account transactions.</p> <p><b>CO5:</b> Export of goods and services under the Foreign Exchange Management Act, 1999.</p> <p><b>CO6:</b> To understand the basic concepts of BOP.</p>
<p align="center"><b>Advanced Accounts (BC-304)</b></p>	<p><b>CO1:</b> Understand Amalgamation of companies. International Accounting Standard 12: Income Taxes.</p> <p><b>CO2:</b> To describe liquidation of companies and lease.</p> <p><b>CO3:</b> Preparation of Accounts of Electricity Companies and International Accounting Standard 33: Earning Per Share.</p> <p><b>CO4:</b> Examination of Accounts of Holding Companies under section 129 of Companies Act 2013.</p> <p><b>CO5:</b> Preparation of consolidated P&amp;L a/c and Balance Sheet including intercompany and chain holdings.</p> <p><b>CO6:</b> Learning International Accounting Standard 23: Consolidated and Separate Financial Statements</p>
<p align="center"><b>Banking and Insurance (BC-305)</b></p>	<p><b>CO1:</b> Explain the structure, functions and modern banking services.</p> <p><b>CO2:</b> Outline bank deposits, lending and role of RBI in credit control.</p> <p><b>CO3:</b> Summarize bank management and negotiable instruments.</p> <p><b>CO4:</b> Summarize the basic principles of insurance.</p> <p><b>CO5:</b> Explain types of insurance.</p>
<p align="center"><b>Summer Training and Project Report (BC-306)</b></p>	<p><b>CO1:</b> Competency in the linking of accounting tools and software's in the real-world enterprise.</p> <p><b>CO2:</b> To learn the components of preparing and presentation of training report.</p> <p><b>CO3:</b> Learning the organizational working and work as a team player.</p> <p><b>CO 4:</b> To understand the importance of working in teams and to become an effective team member.</p> <p><b>CO5:</b> Ability to identify own strengths and weaknesses and use for self-development and improving interpersonal communication skills.</p>
<p><b>B.Com. (Hons.) 6<sup>th</sup> Sem.</b></p>	

<p><b>Goods and Service Tax (BC-307)</b></p>	<p><b>CO1:</b> Connect with the genesis of goods and services tax (GST), decipher the constitutional amendment carried out to install GST in India and comprehend the composition and working of GST council.</p> <p><b>CO2:</b> Understand the meaning of supply under GST law, differentiate between intra-state and inter-state supply, comprehend rules related to the place of supply and compute the value of supply.</p> <p><b>CO3:</b> Comprehend the utilization of input tax credit and the reverse charge mechanism of paying GST and to know the procedure for claiming refund under GST law.</p> <p><b>CO4:</b> Understand the provisions for registration under GST along with special provisions such as those related to anti-profiteering; avoidance of dual control; e-way bills and penalties.</p> <p><b>CO5:</b> Knowing the basic concepts of Customs Act and to compute the assessable value for charging customs duty.</p>
<p><b>Labour Laws (BC-308)</b></p>	<p><b>CO1:</b> Understand evolution of industrial relations and its significance in managerial world.</p> <p><b>CO2:</b> Imbibe how to interact, negotiate and transact with trade unions.</p> <p><b>CO3:</b> Understand the basics of the Employees Provident Fund &amp; Miscellaneous Provisions Act, 1952.</p> <p><b>CO4:</b> Design and understand the discipline measures and address grievance mechanisms.</p> <p><b>CO5:</b> Understanding the Employee's Compensation Act, 1923, The Payment of Bonus Act, 1965, Payment of Gratuity Act, 1972 and Payment of Wages Act, 1936.</p>
<p><b>Entrepreneurship (BC-309)</b></p>	<p><b>CO1:</b> Understand the concept of entrepreneurship in the context of Indian economic scenario.</p> <p><b>CO2:</b> Gather knowledge and ideas on the existing support system for entrepreneurial orientation.</p> <p><b>CO3:</b> Understand enterprise formation process for gaining ideas as to creation of an enterprise for pursuing a career.</p> <p><b>CO4:</b> Understand requirements of post-enterprise creation for effective operation of the business.</p> <p><b>CO5:</b> Gain knowledge on available growth strategies for implementing effective suitable strategy for expansion and growth.</p>
<p><b>Governance, Ethics &amp; Social Responsibility of Business (BC-310)</b></p>	<p><b>CO1:</b> Understanding and develop conceptual thinking about politics and approaches to moral reasoning.</p> <p><b>CO2:</b> Knowledge about the Concept of business and Ethics in business.</p> <p><b>CO3:</b> Comprehend the principles and theories of business ethics.</p> <p><b>CO4:</b> Conceptual framework of corporate governance.</p> <p><b>CO5:</b> Knowledge about the Codes &amp; Standards on Corporate Governance.</p>



<p><b>Auditing (BC-311)</b></p>	<p><b>CO1:</b> Understanding the concept of audit and assurance and the functions of audit, corporate governance, including ethics and professional conduct.  <b>CO2:</b> Demonstrate how the auditor obtain and accepts audit engagements.  <b>CO3:</b> The reflection of Audit work in different types of audit report, written representations and the final review and report.  <b>CO4:</b> Provide and assimilate information leading to failure of organization and corporate scams.  <b>CO5:</b> Comprehend the governance framework for an organization provided by different regulatory bodies in India and Abroad.</p>
<p><b>Cyber Crime and Laws (BC-312)</b></p>	<p><b>CO1:</b> Identification of cyber risk associated with online activities.  <b>CO2:</b> Essentials of preparing laws for safe working in the vertical scenario having varied access points, data sources, network and system related issues, especially in online transactions.  <b>CO3:</b> Generate and preserve electronic evidences for personal and professional use.  <b>CO4:</b> Work in virtual space safely and with business process or products confirming to the regulatory framework and not falling under the ambit of cyber-crimes.  <b>CO5:</b> Analyzing specific cases and finding pertinent facts for resolutions.</p>

**Programme: B.Sc. (Hons.) Economics (Three-year degree programme)**

**PROGRAMME OUTCOMES (POs)**

**PO 1:** Providing with the opportunity to study economics in the greatest depth whilst also providing a considerable amount of choice regarding both the areas of core economics and other applied economics.

**PO 2:** To demonstrate a global perspective and awareness on working of an economy. The course will sharpen analytical skills of students through integrating knowledge of economic theory with decision making techniques. It will demonstrate professionalism, self-awareness, leadership and effective communication skills.

**PO 3:** To use information and knowledge effectively: scanning and organizing data, synthesizing and analysing in order to abstract meaning from information and to share knowledge.

**PO 4:** An ability to use current techniques, skills and tools necessary for studying economics.

**PO 5:** An ability to recognize the importance of professional development by pursuing postgraduate studies or face competitive examinations that offer challenging and rewarding careers in economics.

**PO 6:** Strengthening conceptual building to solve practical decision-making problems, both individually and as part of teams using techniques such as case analysis, projects and assignments.

**PO 7:** Demonstrating a critical awareness of current issues in economics informed by leading edged research and practice in the field.

**PROGRAMME SPECIFIC OUTCOMES (PSOs)**

**PSO 1: Introductory knowledge of microeconomics/macroeconomics:** Understanding the basic concepts of micro-macroeconomics for different sectors of the economy. Application of laws in the derivation of demand and supply under different market scenarios.

**PSO 2: Understanding history of economic ideas/thoughts:** Acquisition of in-depth knowledge about development and evolution of economic thoughts of different schools from ancient world to the present day.

**PSO 3: Derivation of methodologies for determining economic variables:** Derivation of tools and techniques helping empirical determination/estimation of demand, supply, output, money



supply, inflation, employment, poverty, GDP, BOP and optimum input usage. Distribution of resources for maximum welfare and identifying causes of market failure and its consequences.

**PSO 4: Indian economy and World:** Understanding the behaviour of Indian economy and world economy and the working of economic and planning system of India. Major problems associated with the development of Indian economy. Economic evaluation of different government schemes and programmes to tackle these problems. Studying different sectors of the economy and impact of FDI and foreign trade on Indian economy.

**PSO 5: Money and banking:** Understanding the behaviour of financial and money markets and their performance. Cost-Benefit analysis for making investment decisions. Identifying fiscal and monetary tools to regulate the economic forces.

Course	Course Outcomes (COs)
<b>B. Sc. (Hons.) Economics 1<sup>st</sup> Sem.</b>	
<b>Microeconomic Theory – I (ECON 101)</b>	<p><b>CO 1:</b> Understanding the role of micro economics to study human behaviour at an individual level and at producer level.</p> <p><b>CO 2:</b> Decision taking criteria to satisfy unlimited wants from limited resources.</p> <p><b>CO 3:</b> Decision taking criteria regarding use of inputs (factor cost –land, labour, capital).</p> <p><b>CO 4:</b> Understanding the concepts of elasticity in relation to changes in income and price.</p> <p><b>CO 5:</b> Analysing the process of consumer surplus and producer surplus.</p> <p><b>CO 6:</b> Price determination under different market scenario.</p> <p><b>CO 7:</b> Wage determination under different market structure.</p> <p><b>CO 8:</b> Understanding the market signal affecting consumer and producer behaviour.</p>

	<b>CO 9:</b> Analysing theories of production and cost in short and long run.
<b>Macroeconomic Theory –I (ECON 102)</b>	<p><b>CO 1:</b> Understanding the behaviour of economy at the aggregate level and studying the methodology of national income measures.</p> <p><b>CO 2:</b> Knowing the basic economic principles, policies, theories, models, and analytical methods of macroeconomics.</p> <p><b>CO 3:</b> Identification of economic problems and measures to solve them, assessing results, and determining alternative courses of action using various tools.</p> <p><b>CO 4:</b> To understand working of monetary and fiscal policy options related to economic stabilization in the short run and in the long run.</p> <p><b>CO 5:</b> Formulation and assessment of macroeconomic policy initiatives.</p>
<b>Mathematical Methods For Economics-I (MATH 113)</b>	<p><b>CO 1:</b> Students will be able to apply the basic mathematical tools &amp; techniques in economic analyses and interpretations.</p> <p><b>CO 2:</b> To make students capable to understand basic mathematics required for understanding economics.</p> <p><b>CO 3:</b> To familiarize students with the use of mathematics as a tool to analyze economic phenomena.</p>
<b>B. Sc. (Hons.) Economics 2<sup>nd</sup> Sem.</b>	
<b>Microeconomic Theory - II (ECON 103)</b>	<b>CO 1:</b> Price determination under different market scenario.



	<p><b>CO 2:</b> Wage determination under different market structure.</p> <p><b>CO 3:</b> Understanding the market signal affecting consumer and producer behaviour.</p> <p><b>CO 4:</b> Analysing theories of production and cost in short and long run.</p>
<p><b>Macroeconomic Theory – II</b> <b>(ECON 104)</b></p>	<p><b>CO 1:</b> Knowing the basic economic principles, policies, theories, models, and analytical methods of macroeconomics.</p> <p><b>CO 2:</b> Identification of economic problems and measures to solve them, assessing results, and determining alternative courses of action using various tools.</p> <p><b>CO 3:</b> To understand working of monetary and fiscal policy options related to economic stabilization in the short run and in the long run.</p> <p><b>CO 4:</b> Formulation and assessment of macroeconomic policy initiatives.</p>
<p><b>Regional Economics</b> <b>(ECON 105)</b></p>	<p><b>CO 1:</b> Understanding the basic and fundamental knowledge of concepts, theories and practices in the field of regional economics.</p> <p><b>CO 2:</b> Studying regional and social accounting techniques with special reference to under developed regions.</p> <p><b>CO 3:</b> Understanding the nature of dualistic economies and the importance of balanced regional development.</p> <p><b>CO 4:</b> Analysing linkages among different sectors of the economy.</p>

	<p><b>CO 5:</b> Allocation of resources at regional level in achieving specific targets at national level.</p> <p><b>CO 6:</b> Overcoming regional imbalances and inequalities in Indian economy.</p>
<b>B. Sc. (Hons.) Economics 3<sup>rd</sup> Sem.</b>	
<b>Economics of Agriculture (ECON 201)</b>	<p><b>CO 1:</b> Identification and classification of the problems of agricultural activities and understanding to get the maximum satisfaction from existing resources.</p> <p><b>CO 2:</b> Understanding the role of agriculture in economic development and also the factors affecting agricultural growth.</p> <p><b>CO 3:</b> To acquaint the students by role of institutions in agricultural development.</p> <p><b>CO 4:</b> Understanding different economic factors of agricultural development.</p>
<b>B. Sc. (Hons.) Economics 3<sup>rd</sup> Sem.</b>	
<b>Economics of Agriculture (ECON 201)</b>	<p><b>CO 1:</b> Identification and classification of the problems of agricultural activities and understanding to get the maximum satisfaction from existing resources.</p> <p><b>CO 2:</b> Understanding the role of agriculture in economic development and also the factors affecting agricultural growth.</p> <p><b>CO 3:</b> To acquaint the students by role of institutions in agricultural development.</p> <p><b>CO 4:</b> Understanding different economic factors of agricultural development.</p>

<p><b>Economics of Industry</b> (ECON 202)</p>	<p><b>CO 1:</b> Getting acquaintance of analytical skills required for understanding problems in industrial economics.</p> <p><b>CO 2:</b> Analysing aspects of strategic interaction between firms and the determinants of industrial structure.</p> <p><b>CO 3:</b> Understanding of how theories from industrial economics can help one in comprehending the behaviour of firms in imperfectly competitive markets.</p> <p><b>CO 4:</b> Understanding the most important theories concerning the organisation of industries and the behaviour of firms.</p> <p><b>CO 5:</b> Description of pricing behaviour of firms with market power and its welfare implications.</p> <p><b>CO 6:</b> Recognition of the basic determinants of market structure and the key issues in competition policy and regulation.</p>
<p><b>Indian Economy</b> (ECON 203)</p>	<p><b>CO 1:</b> Understanding the various aspects of India's economy since Independence.</p> <p><b>CO 2:</b> Developing a perspective on the different problems and approaches to economy.</p> <p><b>CO 3:</b> Understanding the role of the Indian economy in the global context and factors affecting the process of growth.</p> <p><b>CO 4:</b> Analysing the major development challenges in India; structural transformation, employment, unemployment trends poverty and inequality.</p> <p><b>CO 4:</b> Programmes and emerging perspectives, policy of food and nutrition security of the poor.</p>



<b>Statistical Methods For Economics</b> <b>(STAT 213)</b>	<p><b>CO 1:</b> To acquaint the students with various statistical tools and techniques applied in economics.</p> <p><b>CO 2:</b> To provide fundamental knowledge of basic and advance statistical methods in economics.</p> <p><b>CO 3:</b> In addition to the theoretical approach, the students will be able to learn how to use the software for analyses of empirical data.</p>
<b>B. Sc. (Hons.) Economics 4<sup>th</sup> Sem.</b>	
<b>Labour Economics</b> <b>(ECON 204)</b>	<p><b>CO 1:</b> Understanding the functioning of labour markets through interaction of workers and employers and the dynamics of the markets for wage</p> <p><b>CO 2:</b> Studying the industrial disputes, steps to prevent disputes, methods of settlement of industrial disputes, collective bargaining and also labour participation in management.</p> <p><b>CO 3:</b> Understanding the need for social security measures in India and important labour legislation in India.</p>
<b>International Economics</b> <b>(ECON 205)</b>	<p><b>CO 1:</b> Getting familiarity with the main economic theories and models of international trade.</p> <p><b>CO 2:</b> Application of economic reasoning to issues around the globe.</p> <p><b>CO 3:</b> Recognition of the cause of trade, sources of the gains from trade and the domestic and international distribution of gains.</p>

	<p><b>CO 4:</b> Analysing consequences of trade policy measures—including tariffs and quantitative restrictions.</p> <p><b>CO 5:</b> Understanding of international economics and the determinants of exchange rates and the balance of payments.</p>
<p><b>Money and Financial Markets</b> (ECON 206)</p>	<p><b>CO 1:</b> Understanding the basics of financial institution and markets.</p> <p><b>CO 2:</b> Knowing the functions and operationalization of financial institutions.</p> <p><b>CO 3:</b> Understanding the evolution of financial institutions.</p> <p><b>CO 4:</b> Determination of short-term interest rates and their structure.</p> <p><b>CO 5:</b> Understanding the efficiency of foreign exchange markets.</p>
<p><b>Public Economics</b> (ECON 207)</p>	<p><b>CO 1:</b> Introducing concepts related to government revenue and expenditure.</p> <p><b>CO 2:</b> Fundamental knowledge and exposure of the concepts, theories and practices in the field of public economics</p> <p><b>CO 3:</b> Application of basic tools of economics to public sector like education and health.</p> <p><b>CO 4:</b> Role of public-private sector in the development of an economy.</p> <p><b>CO 5:</b> Understanding the steps followed in budget preparation by Indian parliament and presentation of budget.</p> <p><b>CO 6:</b> Allocation of duties and responsibilities to state and centre under Indian constitution.</p>
<p><b>B. Sc. (Hons.) Economics 5<sup>th</sup> Sem.</b></p>	

<b>Development Economics</b> <b>(ECON 301)</b>	<b>CO 1:</b> Familiarize students with basic concepts of Economic Development and Growth. <b>CO 2:</b> Understand different strategies and models of Economic Development. <b>CO 3:</b> Understand the applicability of different strategies and models in the growth and development process.
<b>History of Economic Thought</b> <b>(ECON 302)</b>	<b>CO 1:</b> Views and ideas of economists starting from ancient Greek period to till present. <b>CO 2:</b> Methodology to know the measurement of goods and the basis on which they can be exchanged in the market. <b>CO 3:</b> Understanding the importance of different factors of production and how they get their rewards. <b>CO 4:</b> Knowing the history of materialistic world and its evolution. <b>CO 5:</b> Learning the contribution of Nobel Laureates in Economics
<b>Econometrics</b> <b>(ECON 303)</b>	<b>CO 1:</b> Acquaintance with various statistical & mathematical tools and techniques applied in economics and policy making. <b>CO 2:</b> Demonstrating a familiarity with the properties and applications of several families of statistical distributions to econometric problems. <b>CO 3:</b> Understanding the application of different models and their usefulness in economics. <b>CO 4:</b> Studying the relevant time series and panel data models for economic policy making and future forecasting.



	<b>CO 5:</b> Learning the application of programme packages to do time series and panel data analyses of empirical data.
<b>Resources and Environmental Economics (ECON 304)</b>	<p><b>CO 1:</b> Extending knowledge about regarding the scarcity of environment resources.</p> <p><b>CO 2:</b> Understanding the inter-linkages of human activities and environment.</p> <p><b>CO 3:</b> Understanding the importance of common property rights in case of public/state resources.</p> <p><b>CO 4:</b> Evaluating cost and optimal level of pollution in the economy.</p> <p><b>CO 5:</b> Regulation of state natural resources through taxes/levies on users.</p> <p><b>CO 6:</b> Detail study of different environmental problems and steps/measure taken to control them.</p>
<b>Introduction to Computer and Office Automation (CSE333)</b>	<p><b>CO 1:</b> Bridge the fundamental concepts of computers with the present level of knowledge of the students.</p> <p><b>CO 2:</b> Create and perform data calculations with Excel spreadsheets and presentations.</p> <p><b>CO3:</b> Students do possess required skill and can also be employed as Tally data entry operator.</p>
<b>B. Sc. (Hons.) Economics 6<sup>th</sup> Sem.</b>	

<p><b>Comparative Economic Development (ECON 306)</b></p>	<p><b>CO1:</b> Describing different perspective regarding economic development.</p> <p><b>CO 2:</b> Assessing the historical development of different countries</p> <p><b>CO 3:</b> Studying in detail the process of development of different countries through case studies.</p> <p><b>CO 4:</b> Understanding the very nature and structure of agriculture sector in developed countries like Britain, Japan and USSR</p> <p><b>CO 5:</b> Analysing the role of manufacturing sector in the development process of developed countries.</p> <p><b>CO 6:</b> Comparison of the development process and policies of developed countries and the present scenario of their development.</p>
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<b>Institutional Economics</b> <b>(ECON 307)</b>	<p><b>CO 1:</b> To familiarize the student with the different types of institutions.</p> <p><b>CO 2:</b> To acquaint the students with the financial institutions and separation of ownership and control, incentive commitment problems of financial institutions.</p> <p><b>CO 3:</b> To understand the legal institutions and their economic performance.</p> <p><b>CO 4:</b> To explain the political economy of institutional changes, political economy of privatization and legal transplantation.</p>
<b>Health Economics</b> <b>(ECON 308)</b>	<p><b>CO 1:</b> Understanding the problems in the market for health care.</p> <p><b>CO 2:</b> Analysing health care markets with economics.</p> <p><b>CO 3:</b> Describing the demand for health and health care.</p> <p><b>CO 4:</b> Management of health care professional and hospitals' services.</p> <p><b>CO 5:</b> Understanding public policies to enhance access with low cost.</p> <p><b>CO 6:</b> Role of WHO in National Health Policy (NHP).</p> <p><b>CO 7:</b> Measures/steps taken in building high class health facilities.</p> <p><b>CO 8:</b> Public-private partnership in creating health care infrastructure.</p>



<p><b>Economics of Industry</b> <b>(ECON 202)</b></p>	<p><b>CO 1:</b> Getting acquaintance of analytical skills required for understanding problems in industrial economics.</p> <p><b>CO 2:</b> Analysing aspects of strategic interaction between firms and the determinants of industrial structure.</p> <p><b>CO 3:</b> Understanding of how theories from industrial economics can help one in comprehending the behaviour of firms in imperfectly competitive markets.</p> <p><b>CO 4:</b> Understanding the most important theories concerning the organisation of industries and the behaviour of firms.</p> <p><b>CO 5:</b> Description of pricing behaviour of firms with market power and its welfare implications.</p> <p><b>CO 6:</b> Recognition of the basic determinants of market structure and the key issues in competition policy and regulation.</p>
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**Programme: BBA (Three year degree programme)**

**PROGRAMME OUTCOMES (POs)**

1. It will nurture socially conscious business professionals with entrepreneurial and management insights.
2. Encourage student's creativity and innovative thinking leading to unique solution for complex problems.
3. Students will learn sound theoretical base and get exposure to current business challenges.
4. Students will develop capabilities and skills in areas of finance, HR and Marketing to take up initial level management roles in industry.
5. Students will be able to take up higher education in the field of Business management.
6. Development of entrepreneurial skills in the student.
7. Development of ethical managers with inter- disciplinary knowledge.

**PROGRAMME SPECIFIC OUTCOME**

1. Apply ethical principles and commitment towards professional ethics and responsibility.
2. Function effectively as a member, leader, individual or group in diverse environment.
3. Ability to conceptualize a complex issue into a coherent written statement and oral presentation and to communicate effectively on complex activities with technical community.
4. Providing an opportunity for the students to gain practical exposure towards the workplace and make them industry ready.
5. Promotes entrepreneurship by providing understanding of the fundamentals of creating and managing innovation, new business development, and high-growth potential entities.
6. Ability to demonstrate technical competence in domestic and global arena of business through the study of major disciplines within the fields of business.

Course	Course Outcomes (Cos)
<b>BBA 1<sup>ST</sup> Sem.</b>	
<b>(BBA-101) Business Organization and Systems</b>	CO1: Understanding of basic concepts of commerce, trade and industry. CO2: Learning about modern business practices. CO3: Knowledge about Practices, procedures and functioning of various business organizations.
<b>(BBA-102) Principles of Management</b>	CO1: Familiarity with basic concepts and thoughts of management. CO2: Knowledge about basic functions of management. CO3: Knowledge about different functional activities under managerial functions.
<b>(BC-107) Basics of Business Accounting</b>	CO1: Understand the theoretical and practical framework of accounting. CO2: Familiarity with financial statement preparation. CO3: Understanding corporate financial statement, their analysis and interpretation.
<b>(ECON-106) Managerial Economics</b>	CO1: Understand the concept of economics and their use in business. CO2: Knowledge to apply micro economics concept and techniques in evaluating business decisions making process. CO3: Knowledge of economics and price determination.
<b>(CSE-109) IT Tools in Business</b>	CO1: Acquaint the students with Information Technology tools. CO2: Usage of various office automation tools for individuals and corporate. CO3: Understand to use the packages of word processing, spread sheet and presentation in detail.
<b>BBA 2<sup>nd</sup> Sem.</b>	
<b>(ENG- 112) Business Communication &amp; Professional Ethics</b>	CO1: Understanding of the concept, process, importance of communication. CO2: Develop effective communication skills- both written and oral. CO3: Acquaint students with application of communication skills in the business world.
<b>(STAT-103) Business Statistics</b>	CO1: Familiarity with various statistical data analysis tools. CO2: There use in effective decision making for business. CO3: Conduct and interpret a variety of hypothesis tests to aid decision making in a business context.
<b>(BC- 108) Basics of Cost Accounting</b>	CO1: Knowledge of Basic cost concepts, element of cost & Preparation of Cost Sheet. CO2: Basic knowledge of important methods and techniques of costing. CO3: Knowledge related to different issues of material valuation etc.
<b>(BBA-103) Business Environment</b>	CO1: Understanding of different concepts of the Indian business environment and the various forms of environments.



	<p>CO2: Understanding of interaction of business and different internal-external forces of environment.</p> <p>CO3: Recognize the mechanism of business and different forces in light of professional ethics and values.</p>
<b>(EDU-101)</b> <b>Human Values and Professional Ethics</b>	CO1: Understand the basic concepts of value, ethics and their importance in professional life.
<b>(BBA-104)</b> <b>Seminar on Contemporary Issues</b>	<p>CO1: Knowledge about contemporary issues in Business management.</p> <p>CO2: Development of presentation skills of students.</p>
<b>BBA 3<sup>rd</sup> Sem.</b>	
<b>(BC-212)</b> <b>Basics of Management Accounting</b>	<p>CO1: Acquaint students with role of Management Accounting in planning, Control and decision-making.</p> <p>CO2: Preparation of income statements using absorption and variable costing.</p> <p>CO3: Understanding of budgetary control system and financial planning.</p>
<b>(BBA-201)</b> <b>Legal Aspect &amp; Business</b>	<p>CO1: Knowledge of the branches of law related to business.</p> <p>CO2: Knowledge about transactions, certain corporate bodies and related matters and to understand the applications of corporate laws to practical commercial situations.</p> <p>CO3: Knowledge about the provisions of companies act.</p>
<b>(BBA-202) Ethics &amp; Corporate Social Responsibility</b>	<p>CO1: Clarity about the importance of ethics in business and practices of good corporate governance.</p> <p>CO2: Knowledge about the corporate social responsibility, importance and applicability of this concept into business in different ways.</p> <p>CO3: Knowledge about the scope of business ethics in Compliance, finance, Human resources, marketing, and production.</p>
<b>(BBA-203)</b> <b>India's Diversity &amp; Business</b>	<p>CO1: Understanding the bases of India's diversity and its linkages with the people, livelihood, and occupational diversity.</p> <p>CO2: Knowledge of different socio-economic challenges.</p> <p>CO3: Understanding the diversity and its implications for the business.</p>
<b>(BBA-204)</b> <b>International Business</b>	<p>CO1: Overall view of international trade and India's involvement with global business</p> <p>CO2: Elements of trade environment which are relevant to the global business operations and developments.</p> <p>CO3: Implementation of principles of international business and strategies adopted by firms to expand globally.</p>

<b>(BBA-205) Seminar on Contemporary Issues</b>	CO1: Knowledge about contemporary issues in Business management. CO2: Development of presentation skills of students.
<b>BBA 4<sup>th</sup> Sem.</b>	
<b>(BBA- 206) Financial Management</b>	CO1: Acquaint students with the techniques of financial management. CO2: Their applications for business decision making. CO3: Knowledge of various capital structure theories and factors affecting capital structure.
<b>(BBA- 207) Human Resource Management</b>	CO1: Develop an understanding of the concept & techniques of essential functions of human resource management. CO2: Knowledge of Indian experiences, approaches and cases. CO3: Understand modern HRM strategies to meet the challenges of changing business environment.
<b>(BBA- 208) Marketing Management</b>	CO1: Familiarity with the marketing function in organizations. CO2: Equip the students with understanding of the marketing mix elements and sensitize them to certain emerging issues in Marketing. CO3: Students will expose to analytical skills in identification and resolution of problems pertaining to marketing management.
<b>(BBA- 209) Operations Management</b>	CO1: Understand the concepts of production and operations management. CO2: Usage of techniques of operations management in business. CO3: Knowledge about the elements of operations management and various transformation processes to enhance productivity and competitiveness.
<b>(BBA- 210) Seminar on Contemporary Issues</b>	CO1: Knowledge about contemporary issues in Business management. CO2: Development of presentation skills of students.
<b>(EVS- 301) Environmental Studies</b>	CO1: Understand the concepts of environment and their use in business.
<b>BBA 5<sup>th</sup> Sem.</b>	
<b>(MATH- 301) Quantitative Techniques for Management</b>	CO1: Acquaint students with the construction of mathematical models for managerial decision making. CO2: Apply these techniques for solving complex management problems. CO3: Demonstrate a professional understanding of the basic mathematical and statistical techniques needed for quantitative analysis.

<b>(CSE- 321) Essentials of E - Commerce</b>	CO1: Understand the basic e-commerce, current and emerging trends. CO2: Familiarity with the mechanism for conducting business transactions through electronic means. CO3: Understand of importance of security, privacy, ethical legal issues of e-commerce.
<b>(BBAF301) Indian Financial system</b>	CO1: Understanding of the role of Indian financial system in economic development. CO2: To learn about Indian financial system and its regulator. CO3: Knowledge of financial services in India.
<b>(BBAHR301) HRD System &amp; Strategies</b>	CO1: Overview of the need for HRD and HRD practices which can develop and improve an organization's systems. CO2: Understanding of components of an optimal HRD climate. CO3: Knowledge related to the strategic issues and strategies related to manpower resources.
<b>(BBAM301) Advertising &amp; Sales Promotion</b>	CO1: Understand the concept, process, importance of advertising and sales promotion. CO2: Understanding the elements of the communication process between buyers and sellers in business. CO3: Utilize marketing research techniques to resolve into competitive marketing decisions.
<b>(BBAF302) Financial Institutions and Markets</b>	CO1: Understanding of different aspects and components of financial Institutions and financial markets. CO2: Enable them to take the rational decision in financial environment. CO3: Understand the challenges of uncertain environment of financial markets, assess them and take appropriate financial and investment decisions.
<b>(BBAHR302) Training &amp; Management Development</b>	CO1: Understand the concept and practice of training and development in the modern organizational setting. CO2: Understand the need and process of training need analysis in organizations. CO3: Understand various training methods and their applicability in different organizational situations.
<b>(BBAM302) Agriculture Marketing</b>	CO1: Understand the concepts of agricultural marketing in a developing country like India. CO2: Understand and appreciate the structure and working of the agricultural marketing system in India. CO3: Learn how agriculture marketing system affects the farmers, consumers and intermediaries.
<b>(BBA- 303) Summer</b>	CO1: To learn the components of preparing and presentation of training report.



<b>Training &amp; Project Report</b>	CO2: Learning of organizational work culture and etiquette. CO3: Development of communication and professional skills.
<b>BBA 6<sup>th</sup> Sem.</b>	
<b>(BBA -304) Business Policy &amp; Strategy</b>	CO1: Equip students with the necessary insights into designing strategies for an organization. CO2: linking the organizations strategies with the changing environment. CO3: Knowledge of Indian business practices through case studies.
<b>(BBA -305) Women Entrepreneurship Development</b>	CO1: Understand the role of women entrepreneurship in different facets of society. CO2: Know the various livelihood supports for women Employment opportunities. CO3: Elucidate the role of various developmental schemes supporting women entrepreneurship.
<b>(BBAF306) Project Appraisal and Analysis</b>	CO1: Develop skills for designing project proposal for various domains. CO2: Understanding of different techniques of project management and forces i.e. financial, technical, environmental etc. CO3: Skills for project evaluation techniques like PERT,CPM etc.
<b>(BBAHR306) Performance &amp; Compensation Management</b>	CO1: Understand the concepts of performance and compensation CO2: Knowledge about the challenges of attracting, retaining and motivating employees to high performance. CO3: Design rational and contemporary compensation systems in modern organizations.
<b>(BBAM306) Supply Chain Management</b>	CO1: Understand the fundamentals of elements and functions of supply chain, role of drivers and demand forecasting. CO2: To apply various techniques of inventory management and their practical situations. CO3: Analyze how supply chain decisions related to facility location can be applied to various industries and designing the supply chain.
<b>(BBA- 307) Business Research Methods</b>	CO1: To provide an exposure to the students pertaining to the nature and extent of research orientation. CO2: Basic knowledge of advanced understanding of business research design options, methodologies and analysis methods (both qualitative and quantitative). CO3: Broad understanding of issues specific to undertaking business research.
<b>(BBA- 308) Seminar on Contemporary Issues</b>	CO1: Knowledge about contemporary issues in Business management. CO2: Development of presentation skills of students.

## **PROGRAMME: M.COM. (TWO YEAR DEGREE PROGRAMME)**

### **PROGRAMME OUTCOMES (POs)**

**PO1:** To provide in-depth understanding of all core areas specifically Advanced Accounting, International Accounting, Management, Security Market Operations and Business Environment, Research Methodology and Tax planning.

**PO2:** Managerial skill of the students are developed by adopting practical approaches such as case study, business games, assignment writing and application of digital technology.

**PO3:** Students are equipped with dual specialization such a combination of Finance and Marketing or Finance and Human Resource Development or Marketing and HRD so as to make them useful human resources to cater to multiple tasking demands in industry.

**PO4:** Students interested in pursuing academic careers acquire the ability to bond with their specializations and come up with primary ideas of research to be carried in their respective fields.

**PO5:** To train the student to develop conceptual, applied and research skills as well as competencies required for effective problem solving and right decision making in routine and special activities relevant to financial management and Banking Transactions of a business.

**PO6:** To facilitate the students for conducting business, accounting and auditing practices, role of regulatory bodies in corporate and financial sectors nature of various financial instruments.

**PO7:** To develop job skills among students and make them confident to face interviews.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

**PSO1:** To inculcate the knowledge of business and the techniques of managing the business with special focus on marketing, Insurance and banking theory law and practices.

**PSO2:** Discuss about the key areas of Financial Management, Marketing, Accounting Standards and Reporting System, Project finance and management, business environment, digital technologies in banking, insurance, human resource skill in maintaining the quality of work life in an organization.

**PSO3:** To develop the decision-making skill through costing methods and practical application of management accounting principles.

**PSO4:** To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, auditing and entrepreneurial development.

**PSO5:** To create awareness in application-oriented research through research for business decisions.

**PSO6:** To enhance the horizon of knowledge in various field of commerce through advertising and sales promotion, auditing and entrepreneurial development.

**PSO7:** To enhance the computer literacy and its applicability in business through latest version on tally and e-commerce principles.

Course	Course Outcomes (COs)
	<b>M. Com. 1<sup>st</sup>Sem.</b>
<b>Management Concepts and Organizational Behavior (MC-501)</b>	CO1: Demonstrate the applicability of the concept of organizational behaviour to understand the behaviour of people in the organization. CO2: Demonstrate the applicability of analysing the complexities associated with management of individual behaviour in the organization. CO3: Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities. CO4: Demonstrate how the organizational behaviour can integrate in understanding the motivation (why) behind behaviour of people in the organization. CO5: Discuss theories of motivations and strategies to improve motivation in the workplace.
<b>Managerial Decisions (MC-502)</b>	CO1: Understand the roles of managers in firms. CO2: Analyse the demand and supply conditions and assess the position of a company. CO3: Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets. CO4: Analyse real-world business problems with a systematic theoretical framework. CO5: Make optimal business decisions by integrating the concepts of economics, mathematics and statistics.
<b>Accounting for Managerial Decisions (MC-503)</b>	CO1: Understand the role of different branches of accounting i.e. Cost, Management and Financial Accounting. The importance of accounting standards and the balance sheets of Public Limited, Banking and Insurance companies. CO2: Analyse the financial statements using various tools such as common size statement, comparative statements, ratio analysis, fund flow and cash flow statements. CO3: Understand various types of costs, break even analysis, Variance analysis and budgeting techniques. CO4: Illustrate latest developments in accounting such as HRA, ABC, Life Cycle Costing, Target Costing, Inflation Accounting and Financial Reporting. CO5: Interpret Financial Statements by using different financial tools and techniques.
<b>Quantitative Techniques (MC-504)</b>	CO1: Demonstrate their understanding of the various measures of central tendency



	<p>CO2: Demonstrate their understanding of the symmetry of the various frequency distributions and the concept of moments and their relation with frequency distribution.</p> <p>CO3: Classification of Correlation and regression of variables and relation of its coefficients</p> <p>CO4: Generate various coefficients of correlation and regression lines from the data.</p> <p>CO5: Compile Probability distributions from the frequency distributions.</p>
<b>Human Resource Management (MC-552)</b>	<p>CO1: Understand the role of the financial manager in growth of the firm by considering the agency relationship.</p> <p>CO2: Apply the time value of money for personal finance management.</p> <p>CO3: Gain the knowledge on application of different techniques of capital budgeting under riskless and risky conditions for the investment decisions.</p> <p>CO4: Build the optimum capital structure to take the optimum financing decisions.</p> <p>CO5: Gain the knowledge on application of relevance and irrelevance theories to take dividend decision.</p>
	<b>M.Com. 2<sup>nd</sup> Sem.</b>
<b>Corporate Financial Accounting (MC 505)</b>	<p>CO1: Understand the regulatory environment in which the companies are formed and operate.</p> <p>CO2: Analyse and provide solid foundation in accounting and reporting requirements of the Companies Act and relevant Indian Accounting Standards.</p> <p>CO3: To build a comprehensive understanding of the advanced issues in accounting for assets, liabilities and owner's equity.</p> <p>CO4: Understand the treatment regarding issue of bonus shares and treatment of prior period profits.</p> <p>CO5: Draft Final Accounts for Manufacturing concerns, Banks and Insurance Companies.</p>
<b>Financial Management (MC 506)</b>	<p>CO1: Explain both the theoretical and practical role of financial management in business corporations.</p> <p>CO2: To develop the analytical skills this would facilitate the decision making in Business situations.</p> <p>CO3: Analyse the importance of capital structure in financial decision.</p> <p>CO4: Enumerate the significance of capital budgeting and process of capital budgeting.</p> <p>CO5: Calibrate the various factors influencing dividend policy.</p>
<b>Marketing Management (MC 507)</b>	<p>CO1: Identify the appropriate pricing strategy for a given marketing situation</p> <p>CO2: Discusses the fundamental marketing concepts, theories and principles in areas of marketing policy, of market and consumer behaviour, of product, distribution, promotion and pricing decisions.</p> <p>CO3: To expose students to a systematic framework of marketing &amp; implementations and to highlight need for different marketing approaches for services, goods, and for household consumers, organizational buyers.</p>

	<p>CO4: Analyze the interaction of marketing and environmental forces through an understanding of marketing decisions and practices with social, technological, economic, and political forces.</p> <p>CO5: Develop and communicate unique marketing mixes and selling propositions for specific products.</p>
<b>Management Control and Information System (MC-508)</b>	<p>CO1: Acquire the knowledge of MS-Access as a database tool to manage the organization information.</p> <p>CO2: Understand the processes of developing and implementing information systems.</p> <p>CO3: Analyze how information technology impacts a firm.</p> <p>CO4: Understand the basic concepts and technologies used in the field of management information systems.</p> <p>CO5: Understand about the importance of managing organizational change associated with information systems implementation.</p>
<b>Strategic Management (MC-566)</b>	<p>CO1: Explore participants to various perspectives and concepts in the field of Strategic Management.</p> <p>CO2: Develop skills for applying these concepts to the solution of business problems.</p> <p>CO3: Create mastery in analytical tools of strategic management.</p> <p>CO4: Students will demonstrate a clear understanding of the concepts, tools &amp; techniques used by executives in developing and executing strategies and will appreciate its integrative and interdisciplinary nature.</p> <p>CO5: Understand to demonstrate effective application of concepts, tools &amp; techniques to practical situations for diagnosing and solving organisational problems.</p>
	<b>M.Com. 3<sup>rd</sup>Sem.</b>
<b>Computer Application and E-Commerce (CSE-551)</b>	<p>CO1: Recognizes the impact of Information and Communication Technologies, on the Internet in business Operations.</p> <p>CO2: Acquire knowledge in identifying the main business and marketplace models for electronic Communications and Trading.</p> <p>CO3: Understand the basic terminology of computers.</p> <p>CO4: Understand the practical concepts of MS Word, MS Excel, MS PowerPoint, and MS Access.</p> <p>CO5: Analyze the steps, tools, and security considerations needed create an E- commerce websites.</p>
<b>Business Environment (MC-509)</b>	<p>CO1: Understand the business environment and its impact on business.</p> <p>CO2: To familiar with economic environment of business.</p> <p>CO3: Illustrate the knowledge of public sector and consumerism in India.</p> <p>CO4: To familiar with Government policies in business promotions.</p> <p>CO5: To appreciate the new technology policy and legal protection for natural environment and their impact on business.</p>
<b>Financial Derivatives (MC-552 F)</b>	<p>CO1: Analyse and price diverse derivatives products to generate an optimal risk management strategy.</p> <p>CO2: Demonstrate critical thinking, analytical and problem-solving skills in the context of derivatives pricing and hedging practice.</p> <p>CO3: Explain the binomial model and its extension in continuous time to the Black-Scholes model.</p>

	<p>CO4: Demonstrate an understanding of pricing forwards, futures and options contracts</p> <p>CO5: Be able to describe standard derivative contracts, their properties and functionality, skills and abilities.</p>
<b>Financial Institutions and Markets (MC-553 F)</b>	<p>CO1: Understand the role and function of the financial system in reference to the macro economy.</p> <p>CO2: Demonstrate an awareness of the current structure and regulation of the Indian financial services sector.</p> <p>CO3: Evaluate and create strategies to promote financial products and services.</p> <p>CO4: Compare the Different Types of Financial Securities - Financial securities – characteristics and types, valuation theories of fixed and variable income securities.</p> <p>CO5: Evaluate the government securities; non-security forms of investment; real estate investment; investment instruments of the money market.</p>
<b>Security Analysis and Portfolio Management (MC-554 F)</b>	<p>CO1: Understand the basic structure and working of primary and secondary financial markets in India and conversant with computation of risk and return measures for financial instruments.</p> <p>CO2: Understand secondary market trading</p> <p>CO3: Understand and appreciate the Fundamental and Technical analysis tools for analyzing financial securities.</p> <p>CO4: Well versed with the concept of a Portfolio and understand the principle portfolio theories.</p> <p>CO5: Acquaint and understand portfolio analysis, portfolio evaluation and portfolio revision techniques.</p>
	<b>M.Com. 4<sup>th</sup>Sem.</b>
<b>Entrepreneurship Development (MC-510)</b>	<p>CO1: Understand the concept of entrepreneurship in the context of Indian economic scenario.</p> <p>CO2: Link the individual's capability and strength as a guiding factor towards entrepreneurial orientation.</p> <p>CO3: Understand social support system for gaining strength towards entrepreneurial preferences.</p> <p>CO4: Understand entrepreneurial process for initiating new venture creation.</p> <p>CO5: Understand various dimensions of managing a business enterprise once it is formed.</p>
<b>Project Management (MC-511)</b>	<p>CO1: Understanding the scope, cost, timing, and quality of the project, at all times focused on project success.</p> <p>CO2: Analyzing the project appraisal techniques with respect to market &amp; demand analysis, situation analysis, collection of information, demand forecasting and market planning.</p> <p>CO3: Understanding the technical and financial analysis with respect to a project.</p> <p>CO4: Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements.</p> <p>CO5: Understanding the role and responsibilities of the project manager, planning, organizing, controlling, project review and administrative aspect and skills of the project manager.</p>



<b>Banking, Insurance and Financial Services</b> <b>(MC-561 F)</b>	<p>CO1: To prepare students to explore opportunities being newly created. In the field of Banking and Insurance due to Globalization, Privatization and Liberalization.</p> <p>CO2: To give an adequate exposure to operational environment in the field of Banking &amp; Insurance.</p> <p>CO3: To provide adequate basic understanding about the field of Banking and Insurance.</p> <p>CO4: To inculcate training and practical approach among the students by using modern technologies in the field of Banking and Insurance.</p> <p>CO5: To enrich students with the knowledge of the functioning of banks and insurance companies.</p>
<b>Tax Planning and Auditing</b> <b>(MC-562 F)</b>	<p>CO1: To familiar with the computation of income from other sources.</p> <p>CO2: To know about the aggregation of income and deduction u/s 80C to 80U.</p> <p>CO3: To aware about the income tax authorities and their powers and duties.</p> <p>CO4: To understand more about government audit, audit of charitable and educational organizations, hospitals, clubs etc.</p> <p>CO5: To acquaint themselves about the concepts and principles of auditing, auditing process and the objectives of auditing.</p>
<b>Multinational Financial System</b> <b>(MC-563F)</b>	<p>CO1: Explain the fundamental theories and concepts of international trade and finance and apply for the management decisions.</p> <p>CO2: Apply functions, provisions of international trade system and functions to facilitate the global trade. Students will be able analyse impact of WTO on current global trade in detail.</p> <p>CO3: Analyse the organizations allocate portfolio assets and take investment decisions. Students will be able to apply the different methods to mitigate the foreign trade and exchange rate risks in their respective organizations after they are recruited.</p> <p>CO4: Integrate concept and apply the knowledge of capital budgeting decisions to mitigate the financial risks of organizations.</p> <p>CO5: Forecast exchange rates based on the parity conditions that should apply between spot rates, forward rates, inflation rates, and interest rates.</p>
<b>Human Values and Professional Ethics in Higher Education</b> <b>(EDU-101)</b>	<p>CO1: Identify and analyze an ethical issue in the subject matter under investigation or in a relevant field.</p> <p>CO2: Demonstrate knowledge of ethical values in non-classroom activities, such as service learning, internships, and field work integrate, synthesize, and apply knowledge of ethical dilemmas and resolutions in academic settings, including focused and interdisciplinary research</p> <p>CO3: Articulate what makes a particular course of action ethically defensible.</p> <p>CO4: Assess their-own ethical values and the social context of problems.</p> <p>CO5: Identify ethical concerns in research and intellectual contexts, including academic integrity, use and citation of sources, the objective presentation of data, and the treatment of human subjects.</p>

**Course Programme: M.Sc. Ag. (Agricultural Economics)**

<b>PROGRAMME OUTCOMES (POs)</b>	
<b>PO1</b>	To provide in-depth knowledge of macroeconomics, microeconomics, econometrics, production economics, agricultural marketing for agricultural research and policy issues.
<b>PO2</b>	Advance the understanding of the students with economic theory, econometrics, production economics, linear programming and farm management with applications in a wide variety of allied fields
<b>PO3</b>	Develop proficiency in quantitative methods and effective use of these techniques to socio economic and resource utilization problems
<b>PO4</b>	Cultivate rational thinking in the students by the introduction of the conditions of rationality in the areas of consumption, production and distribution
<b>PO5</b>	Production of masters in economics with good national and international level knowledge of higher studies in the field of agricultural economics
<b>PO6</b>	Makes the scholars responsible citizens and professionals which have the capability of critical thinking and independent analysis
<b>PROGRAMME SPECIFIC OUTCOMES (PSOs)</b>	
<b>PSO1</b>	To give in-depth knowledge to students about economic theory regarding utilization and allocation of resources including labour, natural resources and capital
<b>PSO2</b>	To upgrade students understanding about the function of agri markets for goods and services and income generation, its distribution and investment
<b>PSO3</b>	To develop understanding of the production systems and allocation of scarce productive resources for optimization of profits under micro and macro conditions.
<b>PSO4</b>	To impart in-depth knowledge into special fields of choice like agricultural economics, basic econometrics, growth and development, agricultural marketing, production economics, environmental economics, agricultural financial institutions and markets.
<b>PSO5</b>	The students after having the understanding of the all the subjects of agricultural economics can easily clear the competitive examinations like NET, SRF, ARS.

Course	Course outcome (COs)
<b>M. Sc Ag. (Agricultural Economics)</b>	
Micro Economic Theory (AG ECON 501)	<b>CO 1:</b> Understanding the concepts of demand, elasticities, consumer's surplus producers' surplus, and price determination under different market scenario. <b>CO 2:</b> Wage determination under different market structure. <b>CO 3:</b> Understanding the market signal affecting consumer and producer behaviour. <b>CO 4:</b> Analysing theories of production and cost in short and long run. <b>CO5:</b> Understanding the methodologies of market models
Macro Economic Theory (AG ECON 502)	<b>CO 1:</b> Knowing the basic economic principles, policies, theories, models, and analytical methods of macroeconomics.

	<p><b>CO 2:</b> Identification of economic problems and measures to solve them, assessing results, and determining alternative courses of action using various tools.</p> <p><b>CO 3:</b> To understand working of monetary and fiscal policy options related to economic stabilization in the short run and in the long run.</p> <p><b>CO 4:</b> Formulation and assessment of macroeconomic policy initiatives using models.</p>
Agricultural Production Economics (AG ECON 504)	<p><b>CO 1:</b> Knowing the basic economic principles, policies, theories, assumptions, models and analytical methods of production theories.</p> <p><b>CO 2:</b> To understand application of linear, quadratic, Spillman, Cobb Douglas, profit and CES etc production function.</p> <p><b>CO 3:</b> Identification of risk and uncertainties and methods to combat them.</p>
Agricultural Marketing (AG ECON 505)	<p><b>CO 1:</b> Knowing the types and characteristics of markets.</p> <p><b>CO 2:</b> To understand application of demand supply models.</p> <p><b>CO 3:</b> Identification of marketing channels, costs and margins.</p> <p><b>CO4:</b> Role and significance of SWC, CWC, NSC, NAFED, FCI, etc</p>
Mathematical and Statistical Techniques (STAT 501)	<p><b>CO 1:</b> Students will be able to apply the basic mathematical tools &amp; techniques in economic analyses and interpretations.</p> <p><b>CO 2:</b> To make students capable to understand basic mathematics required for understanding economics.</p> <p><b>CO 3:</b> To familiarize students with the use of mathematics as a tool to analyze economic phenomena.</p> <p><b>CO4:</b> Understanding the application of Z, t, F, R<sup>2</sup></p>
Research Methodology for Social Sciences (AG ECON 503)	<p><b>CO 1:</b> Understanding the need and significance of research in social sciences and demonstrating the research process.</p> <p><b>CO 2:</b> Getting acquaintance on various methods of sampling, the data collection techniques through schedules and questionnaires.</p> <p><b>CO 3:</b> Acquiring competence in preparation of schedules, questionnaires and their pre-testing and final preparation.</p> <p><b>CO 4:</b> Understanding the formulations of hypothesis, application of tests for the significance of parameters.</p> <p><b>CO 5:</b> Learning documentation writing and its presentation.</p> <p><b>CO 6:</b> Acquiring capability in preparation of projects for funding from various agencies.</p>
Natural Resource and Environmental Economics (AG ECON 506)	<p><b>CO 1:</b> Extending knowledge about regarding the scarcity of environment resources.</p> <p><b>CO 2:</b> Understanding the inter-linkages of human activities and environment.</p> <p><b>CO 3:</b> Understanding the importance of common property rights in case of public/state resources.</p> <p><b>CO 4:</b> Evaluating cost and optimal level of pollution in the economy.</p> <p><b>CO 5:</b> Regulation of state natural resources through taxes/levies on users.</p> <p><b>CO 6:</b> Detail study of different environmental problems and steps/measure taken to control them.</p> <p><b>CO7:</b> Understanding the application of Hedonic, travel cost and CVM in evaluating the natural resources</p>



Econometrics (AG ECON 507)	<p><b>CO 1:</b> Acquaintance with various statistical &amp; mathematical tools and techniques applied in economics and policy making.</p> <p><b>CO 2:</b> Demonstrating a familiarity with the properties and applications of several families of statistical distributions to econometric problems.</p> <p><b>CO 3:</b> Understanding the application of different models and their usefulness in economics.</p> <p><b>CO 4:</b> Studying the relevant time series and panel data models for economic policy making and future forecasting.</p> <p><b>CO 5:</b> Learning the application of programme packages to do time series and panel data analyses of empirical data.</p>
Operations Research (MATH 501)	<p><b>CO1:</b> Understand the basic concept of operation research and identify and develop operational research models from the verbal description of the real system.</p> <p><b>CO2:</b> Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.</p> <p><b>CO3:</b> Understand the mathematical tools that are needed to solve optimization problems.</p> <p><b>CO4:</b> Use CPM and PERT techniques, to plan, schedule, and control project activities.</p> <p><b>CO5:</b> Construct the transportation model and analyze the game theory.</p> <p><b>CO6:</b> Use some solution methods for solving the linear optimization problems.</p> <p><b>CO7:</b> Understanding the queuing theory, replacement theory and theory on simulation of management systems.</p>
Project Management and Entrepreneurship Development (MBA 565)	<p><b>CO1:</b> Understanding the scope, cost, timing, and quality of the project, at all times focused on project success.</p> <p><b>CO2:</b> Analyzing the project appraisal techniques with respect to market &amp; demand analysis, situation analysis, collection of information, demand forecasting and market planning.</p> <p><b>CO3:</b> Understanding the technical and financial analysis with respect to a project.</p> <p><b>CO4:</b> Identify project goals, constraints, deliverables, performance criteria, control needs, and resource requirements.</p> <p><b>CO5:</b> Understanding the role and responsibilities of the project manager, planning, organizing, controlling, project review and administrative aspect and skills of the project manager.</p>
Computer Applications for Agricultural Economics (CSE 551)	<p><b>CO1:</b> Bridge the fundamental concepts of computers with the present level of knowledge of the students.</p> <p><b>CO2:</b> Create and perform data calculations with Excel spreadsheets and presentations.</p> <p><b>CO3:</b> Make able the students to access the internet, worldwide web, as well as use Internet directories and search engines, and locate www addresses.</p> <p><b>CO4:</b> Make able the students to find and evaluate information on the web (learn how to be critical and evaluate what is valid and reliable).</p> <p><b>CO5:</b> Understanding the application of software's such as SPSS, Excel, Szam, Eviews</p>
Economics of Growth and Development	<p><b>CO 1:</b> Familiarize students with basic concepts of economic development and growth.</p>

(AG ECON 508)	<p><b>CO 2:</b> Understand different strategies and models of economic development.</p> <p><b>CO 3:</b> Understand the applicability of different strategies and models in the growth and development process.</p>
International Economics (AG ECON 509)	<p><b>CO 1:</b> Getting familiarity with the main economic theories and models of international trade.</p> <p><b>CO 2:</b> Application of economic reasoning to issues around the globe.</p> <p><b>CO 3:</b> Recognition of the cause of trade, sources of the gains from trade and the domestic and international distribution of gains.</p> <p><b>CO 4:</b> Analysing consequences of trade policy measures—including tariffs and quantitative restrictions.</p> <p><b>CO 5:</b> Understanding of international economics and the determinants of exchange rates and the balance of payments.</p>
History of Economic Thought (AG ECON 510)	<p><b>CO 1:</b> Views and ideas of economists starting from ancient Greek period to till present.</p> <p><b>CO 2:</b> Methodology to know the measurement of goods and the basis on which they can be exchanged in the market.</p> <p><b>CO 3:</b> Understanding the importance of different factors of production and how they get their rewards.</p> <p><b>CO 4:</b> Knowing the history of materialistic world and its evolution.</p> <p><b>CO 5:</b> Learning the contribution of Nobel Laureates in Economics.</p>
Financial Management (MBA 567)	<p><b>CO1:</b> Understanding the basic concept of financial management.</p> <p><b>CO2:</b> Application of tools of financial management for decision making.</p> <p><b>CO3:</b> Develop analytical skills that would facilitate the financial decision making in capital structure and dividend policy.</p> <p><b>CO4:</b> Estimate working capital requirement of Business concern.</p> <p><b>CO5:</b> Identification of factors affecting the capital structure.</p> <p><b>CO6:</b> Understanding the concept of inventory, cash and receivables management.</p>

## **Programme: M.Sc. Economics (Two year degree programme)**

### **PROGRAMME OUTCOMES (POs)**

- PO1:** To provide in-depth knowledge of macroeconomics, microeconomics and econometrics for economic research and policy issues
- PO2:** Advance the understanding of the students with economic theory, econometrics and economic thought with applications in a wide variety of fields within economics
- PO3:** Develop proficiency in quantitative methods and effective use of these techniques to economic problems
- PO4:** Cultivate rational thinking in the students by the introduction of the conditions of rationality in the areas of consumption, production and distribution
- PO5:** Master in economics with good knowledge open up the students for the higher studies in the field of economics at national and international level
- PO6:** Makes the scholars responsible citizens and professionals which have the capability of critical thinking and independent analysis

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

- PSO1:** To give in-depth knowledge to students about economic theory regarding utilization and allocation of resources including labour, natural resources and capital
- PSO2:** To upgrade students understanding about the function of market for goods and services and income generation, its distribution and investment
- PSO3:** To develop understanding of the tax structure and its applications in the economy.
- PSO4:** To impart in-depth knowledge into special fields of choice like agricultural economics, industrial economics, Basic Econometrics, Health Economics, Agricultural Marketing, Labour Economics, Environmental Economics, Financial Institutions and Markets, Contemporary Issues in Indian & World Economy and Globalization & Development
- PSO5:** The students after having the understanding of all the subjects of economics can easily clear the competitive examinations related to economics.



Course	Course Outcomes (COs)
<b>M.Sc. ECONOMICS 1<sup>st</sup> Sem.</b>	
<b>Micro Economic Theory-I ECON 501</b>	<p><b>CO 1:</b> Use the fundamental techniques to identify economic problems and measures to solve them.</p> <p><b>CO 2:</b> Illustrate society's trade-offs by using a production possibilities curve.</p> <p><b>CO 3:</b> Assumption of rationality by individuals and firms.</p> <p><b>CO 4:</b> Introduction to supply and demand and the basic forces that determine equilibrium in a market economy.</p> <p><b>CO 5:</b> Describing the concept of utility.</p> <p><b>CO 6:</b> Analysing theories of production and cost in short and long run.</p>
<b>Macro Economic Theory-I (ECON 502)</b>	<p><b>CO 1:</b> Understanding the behaviour of economy at the macro level and studying the methodology of national income measures.</p> <p><b>CO 2:</b> Apply the principles of macroeconomics in explaining the behaviour of macroeconomic variables in the economy.</p> <p><b>CO 3:</b> Explain classical theory of output and employment.</p> <p><b>CO 4:</b> Understanding the Keynesian theories of income and consumption.</p>
<b>Financial Institutions And Markets (ECON503)</b>	<p><b>CO 1:</b> Explain formal and informal sector, role and function of the financial system.</p> <p><b>CO 2:</b> Describe the current structure and regulation of the Indian financial services sector.</p> <p><b>CO 3:</b> Evaluate and create strategies to promote financial products and services.</p> <p><b>CO 4:</b> Describe financial institutions, types, functions and their regulatory system.</p> <p><b>CO 5:</b> Explain banking services and credit agencies.</p> <p><b>CO 6:</b> Describe the functioning of financial markets and the role of financial institutions within the economic system.</p>
<b>Quantitative Methods (MATH 505)</b>	<p><b>CO 1:</b> Mathematics needed to tackle the various problems of economics.</p> <p><b>CO 2:</b> Applications of differentiation, integration, consumers and producer's optimization problems.</p> <p><b>CO 3:</b> Use of exponential and logarithmic functions to analyze the growth, interest and investment.</p> <p><b>CO 4:</b> Understand and use of the techniques to solve problems in economics, such as profit maximization and cost minimization.</p>

<b>CO 5:</b> Able to learn sampling and census methods.	
<b>Research Methodology (ECON 599)</b>	<p><b>CO 1:</b> To become familiar with basic knowledge research methodology and sampling techniques.</p> <p><b>CO 2:</b> To understand the suitability of various research approaches and techniques to the investigation of specific research questions.</p> <p><b>CO 3:</b> To be able to access the various methodological foundations of empirical findings.</p> <p><b>CO 4:</b> To have critical awareness of ethical prerequisites of research.</p>
<b>M.Sc. ECONOMICS 2<sup>nd</sup> Sem.</b>	
<b>Micro Economic Theory –II (ECON 505)</b>	<p><b>CO 1:</b> Describe different market structure determination under different market scenario.</p> <p><b>CO 2:</b> Wage determination under different market structure.</p> <p><b>CO 3:</b> Understanding the market signals affecting consumer and producer behavior.</p> <p><b>CO 4:</b> Understanding concepts of theories of production and cost in short and long run.</p> <p><b>CO 5:</b> Describe the economic welfare, pareto optimality, market failure and govt. failure.</p>
<b>Macro Economic Theory –II (ECON 506)</b>	<p><b>CO 1:</b> Explain the basic economic principles, policies, theories, models, and analytical methods of macroeconomics.</p> <p><b>CO 2:</b> Identification of economic problems and measures to solve, assessing results and determining alternative courses of action by using various tools.</p> <p><b>CO 3:</b> Make understanding of the working of monetary and fiscal policy related to economic stabilization in the short run and long run.</p> <p><b>CO 4:</b> Formulation and assessment of macroeconomic policy initiatives.</p>
<b>International Economics (ECON 507)</b>	<p><b>CO 1:</b> Be familiar with the main economic theories and models of international trade.</p> <p><b>CO 2:</b> Make understanding of trade policy and its analysis.</p> <p><b>CO 3:</b> Have an elementary understanding of open economy macroeconomics and the determinants of exchange rates.</p> <p><b>CO 4:</b> Understand the concepts and utilization of balance of payments.</p> <p><b>CO 5:</b> Be familiar with international monetary system.</p>
<b>Globalization and Development</b>	<p><b>CO 1:</b> Analytical concepts of the globalization and development.</p> <p><b>CO 2:</b> Knowledge about globalization and sustainable development taking into account both global and local perspectives.</p>

<b>(ECON 508)</b>	<p><b>CO 3:</b> Make familiar about the major theories and methods of globalization and development.</p> <p><b>CO 4:</b> Understand the trends and patterns in FDI and TNCs.</p> <p><b>CO 5:</b> Knowing the relationship between intra and inter firm global trade.</p>
<b>Money and Banking (ECON 509)</b>	<p><b>CO 1:</b> Understand the key issues and concepts of monetary policy.</p> <p><b>CO 2:</b> Describe the monetary and fiscal policies and its measures.</p> <p><b>CO 3:</b> Make familiar with the role of money and banks in the economy.</p> <p><b>CO 4:</b> Explain about the classification of the financial system.</p> <p><b>CO 5:</b> Make familiar with the role, function and policy measures of the Reserve Bank of India and financial development banks.</p>
<b>M.Sc. ECONOMICS 3<sup>rd</sup> Sem.</b>	
<b>Contemporary Issues Of Indian and World Economy (ECON 510)</b>	<p><b>CO 1:</b> Explain various recent issues involved in agricultural, industrial, financial, trade sectors, public institutions and finally human resources development.</p> <p><b>CO 2:</b> Develop a critical understanding of the contemporary issues, problems and potential solutions in the world.</p> <p><b>CO 3:</b> Explain the main problems associated with the recent global economic crisis and its aftermath including poverty, unemployment, inequality, gender disparity.</p> <p><b>CO 4:</b> Describe the existing policy interventions at global, regional and national levels.</p>
<b>Public Finance (ECON 511)</b>	<p><b>CO 1:</b> Describe the functioning of public finance.</p> <p><b>CO 2:</b> Explain the theoretical basis of public expenditures and to analyze their types and economic effects.</p> <p><b>CO 3:</b> Explain the types of public needs and the mechanisms of their financing.</p> <p><b>CO 4:</b> Explain the different types of tax.</p> <p><b>CO 5:</b> Provide knowledge regarding public revenues and expenditures through the budget and to analyze the instruments and objectives of budgetary policy.</p>
<b>Environmental Economics (ECON 512)</b>	<p><b>CO 1:</b> Make familiar with approaches on linkage between natural environment and human Economy.</p> <p><b>CO 2:</b> To make understand the linkages between environmental degradation and economic development.</p> <p><b>CO 3:</b> Make familiar with contemporary environmental problems.</p> <p><b>CO 4:</b> Make familiar with various methods of measurement of environmental resources.</p>



	<p><b>CO 5:</b> Describe theoretical and applied understanding on diverse frameworks of national and global environmental problems, analytical tools, institutional and regulatory mechanisms.</p>
<p><b>Agricultural Economics (ECON 513)</b></p>	<p><b>CO 1:</b> Describe the nature and scope of agricultural economics.</p> <p><b>CO 2:</b> Makes aware about different theories on agricultural development.</p> <p><b>CO 3:</b> Explain the process of agricultural development in the country.</p> <p><b>CO 4:</b> Make familiar with the production functions and economic principles applied to the farm business.</p> <p><b>CO 5:</b> Explain the concept of risk in agricultural marketing.</p>
<p><b>Industrial Economics (ECON 513)</b></p>	<p><b>CO 1:</b> Deals with basic concepts of industry.</p> <p><b>CO 2:</b> Discuss about market product and industrial locations.</p> <p><b>CO 3:</b> Explains the market structure &amp; allocation of resources.</p> <p><b>CO 4:</b> Discuss about the industrial marketing, consumer protection and industrial labour.</p>
<p><b>Basic Econometrics (ECON 513)</b></p>	<p><b>CO 1:</b> Explain the economic models.</p> <p><b>CO 2:</b> Application of the tests for mis-specification and parameter restrictions.</p> <p><b>CO 3:</b> To work out solutions for violations of classical assumptions.</p> <p><b>CO 4:</b> Suggest methods for choosing between different models.</p> <p><b>CO 5:</b> Make familiar with the use of different software and interpretations of the results.</p>
<p><b>Agricultural Marketing (ECON 514)</b></p>	<p><b>CO 1:</b> Explain market concepts, marketing of agricultural commodities and intermediaries.</p> <p><b>CO 2:</b> Understand the marketing channels of different commodities.</p> <p><b>CO 3:</b> Provides practical knowledge of price spread and its implications.</p> <p><b>CO 4:</b> Explain the role of marketing institutions and trade in agricultural products like WTO and APEDA.</p> <p><b>CO 5:</b> Describe the practical knowledge on FCI, CWC and regulated market activities.</p> <p><b>CO 6:</b> Explain the role of CACP for price fixation and price stabilization measures.</p> <p><b>CO 7:</b> Explains role of govt. in regulation of markets and agriculture price policy.</p>

<b>Labour Economics (ECON 514)</b>	<b>CO 1:</b> Make aware of different theories on labour and employment. <b>CO 2:</b> Analysis of latest development in labour market in developing countries. <b>CO 3:</b> Emphasis on wage determination in different markets. <b>CO 4:</b> Extending knowledge about industrial relations and working of trade unions. <b>CO 5:</b> Understanding the labour policy initiatives.
<b>Health Economics (ECON 514)</b>	<b>CO 1:</b> Understanding economic evaluation of health. <b>CO 2:</b> Role of insurance policies to minimize the risk, eligibility criteria and procedural formalities. <b>CO 3:</b> Development of strategies to minimize the different types of risk. <b>CO 4:</b> Understanding mechanism of finance related to health.
<b>Computer Applications for Economics (CSE 541)</b>	<b>CO 1:</b> Understanding the concepts of information, languages, CPU, storage devices, etc. <b>CO 2:</b> Application of MS office, MS excel, MS power point and soft wares. <b>CO 3:</b> Learning operating systems, window operating system, computer network, LAN & WAN. <b>CO 4:</b> Understanding application and role of internet services and websites.

## **Programme: MBA (Two year degree programme)**

### **PROGRAMME OUTCOMES (POs)**

**PO1:** Communicate effectively in a variety of formats.

**PO2:** Identify the key issues facing a business or business subdivision.

**PO3:** Utilize qualitative and quantitative methods to investigate and solve critical business problems.

**PO4:** Integrate tools and concepts from multiple functional areas (i.e. finance, marketing, operations, etc.) to solve business problems.

**PO5:** Evaluate and integrate ethical, social and environmental responsibilities in business environment.

**PO6:** Incorporate diversity and multicultural perspectives when making business decision.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs): MBA- Marketing**

**PSO1:** Prepare students to meet the diverse set of marketing challenges present in today's competitive business environment from understanding the evolving needs of the consumer, to managing sales, to overseeing international marketing and distribution operations.

**PSO2:** Addressing the specific consumer decision process, internal and external influences on consumer behavior.

**PSO3:** Developing a brief knowledge about service marketing, its marketing mix and how peoples importance in service marketing.

**PSO4:** Understand the basic concepts in marketing, marketing environment and develop an understanding about communication, marketing Communication and its usage.

**PSO5:** Understand the various types of advertising, its applications and usage with effect to marketing scenario, role of advertising on the global marketing, usage of advertising campaign and estimation of advertising budget.



### **PROGRAMME SPECIFIC OUTCOMES (PSOs): MBA- Finance**

**PSO1:** Enable the students to apply the knowledge of accounting standards, financial analytical tools, costing techniques etc.

**PSO2:** Analyzing the financial performance of an organization and applying various tools that aid in decision making.

**PSO3:** The students will be able to identify the relevance of Financing, Investing & Dividend decisions that impact the growth of the firm.

**PSO4:** The students will be enabled to enhance their knowledge on various financial markets and services provided by the different Financial Institutions.

**PSO5:** Analyze and understand the various avenues of investment in context of risk and return and to know the financial perspective of risk management at global level in a broader context.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs): MBA- Human Resource Management**

**PSO1:** Understand the basic concepts of human resources management and its applications in the individual, group as well as organizational levels.

**PSO2:** Theoretical knowledge in allied subjects such as organizational behavior, business ethics, communication, quantitative techniques in management, labor, and industrial laws, etc.

**PSO3:** Practical knowledge and hands-on training in various areas of HR such as recruitment and selection, performance appraisal, management of change, conflict, stress, counseling etc. **PSO4:** Practical exposure to the problems and opportunities of Human resources management through the two project studies one theoretical (Organizational study) and the other practical (Problem centered study).

Course	Course Outcomes (COs)
<b>MBA 1<sup>st</sup> Sem.</b>	
MBA-501 Management Principles & Organizational Behavior	<p><b>CO1:</b> Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.</p> <p><b>CO2:</b> Demonstrate the applicability of the concept of organizational behavior to understand the behavior of people in the organization.</p> <p><b>CO3:</b> Understanding the concept of perception, factors influencing the perception and theories of motivation.</p>
MBA-502 Accounting for Managers	<p><b>CO1:</b> Understand the basic concepts and principles of accounting in business transactions.</p> <p><b>CO2:</b> Understand Double entry system and GAAP principles and record the business transactions in journal, ledger and trail balance.</p> <p><b>CO3:</b> Familiarize with the preparation and analysis of financial statements.</p> <p><b>CO4:</b> Gain insight into the budget and budgetary control measures.</p>
MBA-503 Research Methodology in Business Management	<p><b>CO1:</b> Understanding the concept of research, research applications in functional areas of business and emerging trends in business research.</p> <p><b>CO2:</b> Elaborate the scientific method of research, formulation of research projects, steps in research process and preparation of synopsis.</p> <p><b>CO3:</b> Understanding the qualities of a good hypothesis and concept of hypothesis testing and test of significance.</p> <p><b>CO4:</b> Understanding the data analysis, graphical representation of data and writing of manuscripts.</p>
MBA-504 Business Environment	<p><b>CO1:</b> Understand the basic features of Indian economy and analyze the environment of a business from the legal &amp; regulatory, macroeconomic, cultural, political, technological and natural perspectives.</p> <p><b>CO2:</b> Understand the effects of government policy on the business and outline how an entity operates in a business environment.</p> <p><b>CO3:</b> Analysis of current year annual budget and evaluation of various regulatory policies of government such as industrial policy, fiscal and monetary policy and salient features of FEMA.</p> <p><b>CO4:</b> Conduct an in-depth analysis of a foreign trade, disinvestment and Export- Import policy.</p>
CSE-551 Computer Applications	<p><b>CO1:</b> Learn basic principles of using windows operation system.</p> <p><b>CO2:</b> Be able to find and evaluate information on the web (learn how to be critical and evaluate what is valid and reliable).</p> <p><b>CO3:</b> Learn basic word processing skills with Microsoft Word, such as text input and formatting.</p>
ENG-525 Managerial Communication Skills	<p><b>CO1:</b> Understand the principles of effective communication and barriers of communication.</p>

	<p><b>CO2:</b> Understanding the process of interviews in - selection or placement interviews, discipline interviews, appraisal interviews and exit interviews.</p> <p><b>CO3:</b> Give managerial speeches such as speech of introduction, speech of thanks, occasional speech, and theme speech and can give presentations and understand the concept of non-verbal communication.</p> <p><b>CO4:</b> Write business letters, routine letters, sales letters and essential of oral presentation.</p>
<b>MBA 2nd Sem.</b>	
ECON-555 Managerial Economics	<p><b>CO1:</b> Understanding the basic concepts of managerial economics.</p> <p><b>CO2:</b> Basic concepts of demand, supply and equilibrium and their determinants and also analyzing the effect of these factors on market.</p> <p><b>CO3:</b> Understanding the basic concept of measuring elasticity and apply the concepts of price, cross and income elasticity, main determinants of elasticity and analyze how elasticity affects revenue.</p> <p><b>CO4:</b> Design competition strategies, including costing, pricing, product differentiation, and market environment according to the natures of products and the structures of the markets.</p>
MBA-505 Business Legislations	<p><b>CO1:</b> Understand the general legal boundaries that define the regulation of business.</p> <p><b>CO2:</b> Recognize the most common forms of business associations, including partnerships, limited liability companies, and corporations.</p> <p><b>CO3:</b> Understanding the benefits of Consumer Protection Act in resolution of consumer queries.</p> <p><b>CO4:</b> Prepare different negotiable instruments like Bills of Exchange, Promissory Note and Cheque and analyze the conditions of dishonor of negotiable instruments and right of the party at loss.</p>
MBA-506 Production and Operations Management	<p><b>CO1:</b> Understand the core features of the operations and production management function at the operational and strategic levels.</p> <p><b>CO2:</b> Understand the process of new product development.</p> <p><b>CO3:</b> Conduct Facility planning by making location and layout decisions.</p> <p><b>CO4:</b> Analyze and evaluate various facility alternatives and their capacity decisions, develop a balanced line of production &amp; scheduling and sequencing techniques in operation environments.</p>
MBA-507 Marketing Management	<p><b>CO1:</b> Students will be able to understand the marketing concepts and its evolution.</p> <p><b>CO2:</b> Analyze the market based on segmentation, targeting and positioning.</p> <p><b>CO3:</b> Knowledge about the consumer behavior and their decision making process.</p> <p><b>CO4:</b> Make decisions on product, price, promotion mix and distribution.</p> <p><b>CO5:</b> Understanding of the rural markets and the contemporary issues in marketing.</p>

<p>MBA -508 Human Resource Management</p>	<p><b>CO1:</b> Understanding of the basic concepts, functions and processes of human resource management and role played by HR Manager.  <b>CO2:</b> To design and formulate various HRM processes such as recruitment, selection, training and also help to evaluate and design various organizational structures and understand how they are related to organizational success.  <b>CO3:</b> Development, performance appraisals and reward Systems, compensation Plans and ethical behavior and to be able to form a policy for job analysis.  <b>CO4:</b> Evaluate the developing role of human resources in the global arena.</p>
<p>MBA-509 Management Information System</p>	<p><b>CO1:</b> Understand the leadership role of management information systems in achieving business competitive advantage through informed decision making.  <b>CO2:</b> Analyze and synthesize business information and systems to facilitate evaluation of strategic alternatives.  <b>CO3:</b> Identify managerial challenges and opportunities for organizational advancement that may be resolved by the application of current new technologies.  <b>CO4:</b> Explain applications as groupware the Internet, executive information systems, telecommunications and other organizational support technologies and relate them to solving organization problems.</p>
<p><b>MBA 3<sup>rd</sup> Sem.</b></p>	
<p>MATH-540 Operation Research</p>	<p><b>CO1:</b> Understand the basic concept of operation research and identify and develop operational research models from the verbal description of the real system.  <b>CO2:</b> Develop linear programming (LP) models for shortest path, maximum flow, minimal spanning tree, critical path, minimum cost flow, and transshipment problems.  <b>CO3:</b> Understand the mathematical tools that are needed to solve optimization problems.  <b>CO4:</b> Use some solution methods for solving the linear optimization problems.</p>
<p>MBA -510 Project Management and Entrepreneurship Development</p>	<p><b>CO1:</b> Understanding the scope, cost, timing, and quality of the project, at all times focused on project success.  <b>CO2:</b> Align the project to the organization's strategic plans and business justification throughout its lifecycle.  <b>CO3:</b> Analyzing the project appraisal techniques with respect to market &amp; demand analysis, situation analysis, collection of information, demand forecasting and market planning.</p>



	<b>CO4:</b> Understanding the role and responsibilities of the project manager, planning, organizing, controlling, project review and administrative aspect and skills of the project manager.
MBA -511 Strategic Management	<p><b>CO1:</b> Understanding the importance, scope and concept of strategy and strategic management process and differentiate between tactics, strategies and planning and importance of each component in strategic management.</p> <p><b>CO2:</b> Prepare Vision, Mission statements and define goals, objectives for organization and prepare Value Chain Analysis and identify the areas of concern affecting customer satisfaction</p> <p><b>CO3:</b> Demonstrate the importance of external environmental analysis as well prepare the SWOT Analysis model for decision making.</p> <p><b>CO4:</b> Apply the concepts of BCG matrix and GE9 cell matrix for business portfolio analysis and demonstrate the Porter's 5 forces model for industry environmental analysis.</p>
MBAM-512 Advertisement & Consumer Behavior	<p><b>CO1:</b> Understand different types of advertisement.</p> <p><b>CO2:</b> Identify the key players in advertising industry.</p> <p><b>CO3:</b> Helps to make decisions regarding the most feasible advertising appeal and media.</p> <p><b>CO4:</b> Importance of understanding consumer behavior in marketing.</p>
MBAM-513 Services Marketing	<p><b>CO1:</b> To understand the basic concept of service marketing and role played by marketing manager.</p> <p><b>CO2:</b> Know in detail about the service sector and apply the 7 P's of service marketing.</p> <p><b>CO3:</b> To emphasize the significance of services marketing in the global economy.</p> <p><b>CO4:</b> To make the students understand the deeper aspects of successful services marketing.</p>
MBAM-514 Retail Marketing	<p><b>CO1:</b> Understand the concepts of effective retailing.</p> <p><b>CO2:</b> To provide insights into all functional areas of retailing and to give an account of essential principles of retailing.</p> <p><b>CO3:</b> To give a perspective of the Indian retailing scenario.</p> <p><b>CO4:</b> Know the recent trends in retailing in India.</p> <p><b>CO5:</b> Possess the knowledge of various retail formats and will be understand the retail customer</p>
MBAF-512 Financial Engineering	<p><b>CO1:</b> Understanding the scope and tools used in financial engineering and apply the knowledge of statistics, technology, legal, accounting and taxation in area of financial engineering.</p> <p><b>CO2:</b> Develop an ability to function on inter-professional teams.</p> <p><b>CO3:</b> Develop an ability to identify, formulate, and solve financial engineering problems.</p> <p><b>CO4:</b> Understand the impact of financial engineering and risk management solutions in a global, economic, environmental, and societal context.</p>

MBAF-513 Security Analysis & Portfolio Management	<p><b>CO1:</b> Recognize and apply appropriate theories, principles, and concepts relevant to securities analysis and portfolio management.</p> <p><b>CO2:</b> Value the equities and bonds and understanding the risk and return relationship in terms of the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT).</p> <p><b>CO3:</b> Understand basics in derivatives and develop an ability to manage the portfolio among the various financial alternative.</p>
MBAF-514 Financial Management	<p><b>CO1:</b> Understanding the basic concept of financial management.</p> <p><b>CO2:</b> Apply the tools from financial management that will facilitate for the decision making in context of capital budgeting, cost of capital and source of fund.</p> <p><b>CO3:</b> Develop analytical skills that would facilitate the financial decision making in capital structure and dividend policy.</p> <p><b>CO4:</b> Estimate working capital requirement of Business concern.</p>
MBAH-512 Organizational Change and Development	<p><b>CO1:</b> Developing a basic understanding and appreciation for the issues and conditions creating the need for change in modern organizations.</p> <p><b>CO2:</b> Developing an understanding of the strategic role of change in the organization and the impact of change on organizational performance.</p> <p><b>CO3:</b> Developing a basic understanding of how organizations behave and react to change, why change efforts can fail, overcoming organizational resistance, and making change possible.</p> <p><b>CO4:</b> Learning how to apply some of the key concepts and tools organizational development and change leadership and management.</p>
MBAH-513 Compensation Management	<p><b>CO1:</b> Understand the basic concepts of compensation management and design compensation system in an organization.</p> <p><b>CO2:</b> Relate compensation management to behavioral theories and concepts and within the wider context of human resources management.</p> <p><b>CO3:</b> Administer the compensation package for special groups and describe the process and evaluate the implications of job evaluation.</p> <p><b>CO4:</b> Identify the internal and external environmental factors that have an impact on the pay structure of an organization.</p>
MBAH-514 Human Resource Planning & Development	<p><b>CO1:</b> Integrated perspective on role of HRM in modern business and ability to plan human resources and implement techniques of job design.</p> <p><b>CO2:</b> Rational design of compensation and salary administration.</p> <p><b>CO3:</b> Competency to recruit, train, and appraise the performance of employees.</p> <p><b>CO4:</b> Ability to handle employee issues and evaluate the new trends in HRM.</p>
<b>MBA 4<sup>th</sup> Sem.</b>	
MBAM-515 International Marketing	<p><b>CO1:</b> To help the students understand the peculiarities of international marketing and to develop the students' ability to devise marketing mix for international marketing.</p>

	<p><b>CO2:</b> To make the students understand the concept and techniques of international marketing.</p> <p><b>CO3:</b> Train the students to develop plans and marketing strategies for entering into international markets and managing overseas operations.</p> <p><b>CO4:</b> Analyze about international marketing, its opportunities and promotional policies of the governments to augment trade.</p> <p><b>CO5:</b> Gain in-depth knowledge on Export – procedure &amp; documentation, product planning and policy, Pricing, Distribution, Promotion and Financing.</p>
<p>MBAM-516</p> <p>Sales management</p>	<p><b>CO1:</b> Helps to explain the basic principles of sales management.</p> <p><b>CO2:</b> Helps to demonstrate an understanding of the role of the sales force as a part of the marketing mix.</p> <p><b>CO3:</b> Helps to apply in a competent manner sales management tools such as sales forecasting, sales compensation methods, sales budgeting, sales reports, routings, quotas, sales analysis, and evaluation of performance by means of a team project that creates a sales force plan.</p> <p><b>CO4:</b> Understanding the role of the function of sales management in the corporate structure.</p>
<p>MBAF-515</p> <p>International Finance</p>	<p><b>CO1.</b> Understand foreign exchange markets, international financial markets and their functions and needs and describe the international financial environment in context of international fund flows and international financial agencies and how they affect the multinational corporations.</p> <p><b>2.</b> Understand operations in foreign exchange market and demonstrate knowledge of basic theorems of exchange rate determination, interest rates and inflation and the role of arbitrage in keeping the foreign exchange market efficient.</p> <p><b>3.</b> Understand the exchange rate movement, exchange rate equilibrium and factors affecting the foreign exchange rate.</p> <p><b>4.</b> Apply knowledge of foreign exchange hedging to identify and manage the foreign exchange risks faced by multinational corporations.</p>
<p>MBAF-516</p> <p>Management of Financial Services</p>	<p><b>CO1:</b> Describe the various financial services, its nature and scope and demonstrate an awareness of the current structure and regulation of the Indian financial services sector.</p> <p><b>CO2:</b> Understand the hire purchase, leasing system and describe the factoring, forfeiting and bill discounting and an analysis of depositories act.</p> <p><b>CO3:</b> Understand the credit rating process and methodology adopted by various institutions</p> <p><b>CO4:</b> Understand theoretical frame work and legal frame work in context of venture capital financing.</p>

<p>MBAH-515</p> <p>Industrial Relations and Labour Legislations</p>	<p><b>CO1:</b> Understanding of rationale behind labor laws.</p> <p><b>CO2:</b> Equip students with important provisions of various labor laws.</p> <p><b>CO3:</b> Insight into the implementation of labor laws.</p> <p><b>CO4:</b> To be able to shape ethical behavior of employees through right policies.</p>
<p>MBAH-516</p> <p>International HRM</p>	<p><b>CO1:</b> Acquire exposure to the concepts, principles and the changes occurring in the field of HRM at the national and international level.</p> <p><b>CO2:</b> Understand international staffing, performance appraisal and management development.</p> <p><b>CO3:</b> Understand the HR challenges of international business.</p> <p><b>CO4:</b> Importance of cultural sensitivity in an international assignment.</p> <p><b>CO5:</b> Critically appraise the impact of cultural and contextual factors in shaping human resource practices in MNCs.</p>



## **PROGRAMME: PH.D. COMMERCE**

### **THREE-YEAR (MINIMUM & MAXIMUM OF FIVE YEARS) FULL-TIME PROGRAMME**

#### **PROGRAMME OUTCOMES (POs)**

**PO 1:** This degree programme provides opportunity to students to study the application of commerce in depth which someone may wish to apply for building blocks in area of research.

**PO 2:** Bestow upon students a comprehensive understanding of advanced concepts and modern practices of Commerce and make them industry ready.

**PO 3:** The students should learn to apply the knowledge of statistics and management to the solution of multifaceted problems.

**PO 4:** Employ innovative knowledge and imaginative methods including design of research design, analysis, and interpretation of multivariate data, an amalgamation of the information to provide valid conclusions.

**PO 5:** Create, select, and apply appropriate techniques, resources, and modern software's tools including forecasting and modelling to composite activities to complete the research topic selected.

**PO 6:** Conceptual building through the application of conceptual commerce foundations to solve practical decision-making problems, both individually and as part of teams using techniques such as case analysis, projects and assignments.

**PO 7:** An ability to familiarize with ethical issues in educational research, including those issues that arise in using quantitative research and make them employable in reputed higher institutions.

#### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** The Ph.D. students would gain a thorough understanding of various avenues for conducting research in the field of commerce, management, and economics.

**PSO 2:** The commerce, management economics, and finance pedagogy offer a number of specializations and practical exposures that would equip the scholars to face the contemporary challenges in the field of commerce, management, and business.

**PSO 3:** The comprehensive outlook of the course offers value based and job-oriented courses that ensure that students are trained in state-of-the-art, technology, commerce and management.

**PSO 4:** Apply research methodologies while publishing research papers and to develop skills in the application of research methods for business problem solving.

**PSO 5:** Doctoral research helps in able to understand subjects clearly and communicate effectively making them ideal choice for occupying academic positions.

**PSO 6:** Gain and up-to-date knowledge on research methods, techniques and SPSS package which is used in analysing data in research.

**PSO 7:** To get a comprehensive understanding of experimental and analytical techniques, and a thorough knowledge of the literature, applicable to their own research.

Course	Course Outcomes (COs)
	<b>Ph.D. 1<sup>st</sup> Sem.</b>
<b>Statistical Methods (COM 601)</b>	CO1: Describe and discuss the key terminology, concepts tools and techniques used in business statistical analysis. CO2: Critically evaluate the underlying assumptions of analysis tools. CO3: Understand and critically discuss the issues surrounding sampling and significance. CO4: Discuss critically the uses and limitations of statistical analysis. CO5: Solve a range of problems using the techniques covered
<b>Indian Financial System (COM 602)</b>	CO1: Understand the meaning and scope of financial markets as well as institutions in India. CO2: Understand the concepts of Money Market and Capital Market. CO3: Explain Commercial Banking and its Current developments. CO4: Explain concept of Non-Banking Financial Companies (NBFC's) CO5: Examine the Stock Exchange Operations.
<b>Industrial Relation and labour Laws (COM 603)</b>	CO1: Understand evolution of industrial relations and its significance in managerial world. CO2: imbibe how to interact, negotiate and transact with trade unions. CO3: Acquaint with the basic framework of collective bargaining and workers' participation. CO4: Design and understand the discipline measures and address grievance mechanisms. CO5: understand the legal structure provided for grievance handling under the Industrial Disputes Act 1947.
<b>Advance Human Resource Management (COM 604)</b>	CO1: Understand basic nature and importance of human resource management. CO2: Analyze the current theory and practice of recruitment and selection. CO3: Realize the importance of performance management system in enhancing employee performance. CO4: Recommend actions based on results of the compensation analysis and design compensation schemes that are cost effective, that increase productivity of the workforce, and comply with the legal framework. CO5: Understand role of modern HRM in meeting challenges of changing business environment.
<b>Security Analysis and Portfolio Management (COM 605)</b>	CO1: Understand the basic structure and working of primary and secondary financial markets in India and conversant with computation of risk and return measures for financial instruments. CO2: Understand secondary market trading CO3: Understand and appreciate the Fundamental and Technical analysis tools for analyzing financial securities. CO4: Well versed with the concept of a Portfolio and understand the principle portfolio theories.

	CO5: Acquaint and understand portfolio analysis, portfolio evaluation and portfolio revision techniques.
<b>Marketing Research (COM 606)</b>	CO1: To enhance the students understanding of the marketing research industry. CO2: To develop skills required by the researcher and understand different applications of Marketing Research. CO3: To explore different approaches of Marketing research. CO4: To be able to exploit Marketing Research data for management decision-making. CO5: To evaluate the corporate public relations and tools and apply a research in the marketing area.
<b>Taxation Policy (COM 607)</b>	CO1: Understand the basic concepts in the law of income tax and determine the residential status of different persons. CO2: Identify the five heads in which income is categorized and compute income under the heads, Salaries" and Income from "House Property". CO3: Compute income under the head "Profit and gains of business or profession "Capital gains" and Income from other sources. CO4: Understand clubbing provisions, aggregate income after set-off and carry forward of losses, and deductions allowed under the Income Tax Act; and further to compute tax able in come and tax liability of individuals and firms. CO5: Develop the ability to file online returns of income.
<b>Entrepreneurship and Development (COM 608)</b>	CO1: Understand the concept of entrepreneurship in the context of Indian economic scenario. CO2: Link the individual's capability and strength as a guiding factor towards entrepreneurial orientation. CO3: Understand social support system for gaining strength towards entrepreneurial preferences. CO4: Understand entrepreneurial process for initiating new venture creation. CO5: Understand various dimensions of managing a business enterprise once it is formed.
<b>Research Methodology (COM 699)</b>	CO1: To familiarize participants with basic of research and the research process. CO2: To enable the participants in conducting research work and formulating research synopsis and report. CO3: Identify and discuss the complex issues inherent in selecting a research problem, selecting an appropriate research design, and implementing a research project. CO4: To impart knowledge for enabling students to develop data analytics skills and meaningful interpretation to the data sets so as to solve the business/Research problem. CO5: To familiarize participants with Statistical packages such as SPSS/Excel.

## **PROGRAMME: Ph.D. ECONOMICS**

### **PROGRAMME OUTCOMES (POs)**

**PO 1:** This degree programme provides opportunity to students to study the application of economics in depth which someone may wish to apply for building blocks in area of research.

**PO 2:** To demonstrate a global perspective and awareness on working of an economy. The course will sharpen analytical skills of students through integrating knowledge of economic theory with decision- making techniques. It will demonstrate professionalism, self-awareness, leadership and effective communication skills.

**PO 3:** Use information and knowledge effectively through scanning, organizing, synthesizing and analysing the data in order to abstract meaning and to share knowledge.

**PO 4:** An ability to use current techniques, skills and tools necessary for the study of economic aspects.

**PO 5:** An ability to recognize the importance of professional development by pursuing the doctorate studies or face competitive examinations that offer challenging and rewarding careers in economics.

**PO 6:** Conceptual building through the application of conceptual economics foundations to solve practical decision-making problems, both individually and as part of teams using techniques such as case analysis, projects and assignments.

**PO 7:** An ability to demonstrate a critical awareness of current issues in economics which are informed by leading edged research and practice in the field.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** Understanding the basic and advanced concepts of micro-macroeconomics for different sectors of the economy. Application of laws in the derivation of demand and supply under different market scenarios.

**PSO 2:** Derivation of tools and techniques helping empirical determination/estimation of demand, supply, output, money supply, inflation, employment, poverty, GDP, BOP and optimum inputs usage. Distribution of resources for maximum welfare and identifying causes of market failure and its consequences.

**PSO 3:** Understanding the design of the tax structure and application of the concepts of efficiency and equity.

**PSO 4:** Doctoral research tries to deepen specialization in a particular professional direction.



**PSO 5:** Doctoral research helps in shaping the future of specialist by individual cognitive activities aimed at obtaining new, knowledge, solving theoretical and practical problems, self-education and self-realization.

**PSO 6:** Understanding the role of price policy in economic development; the operation mechanism of commodity markets and price discovery.

<b>COURSE</b>	<b>COURSE OUTCOMES (COs)</b>
<b>Ph.D 1<sup>st</sup>Sem.</b>	
<b>Advanced Micro Economics (ECON 601)</b>	<p><b>CO1:</b> Understanding the modern microeconomic focussing on risk and uncertainty.</p> <p><b>CO 2:</b> Understanding the role of microeconomics in policy formulation in the context of perfect and imperfect markets.</p> <p><b>CO3:</b> Introduction to general and partial equilibrium in the context of production and consumption.</p> <p><b>CO4:</b> Understanding the concepts of welfare economics and application of welfare maximizing criteria.</p> <p><b>CO 5:</b> Application of game theory under competitive strategies&amp; choice making under risk and uncertainty.</p> <p><b>CO6:</b> Determination of factor pricing in the international trade.</p>
<b>Macro Economics (ECON602)</b>	<p><b>CO 1:</b> Understanding the concepts of macroeconomics under static and dynamic scenario.</p> <p><b>CO 2:</b> Comparing and contrast the classical, neo-classical and Keynesian-neo Keynesian perspectives for determination of output and employment.</p> <p><b>CO 3:</b> Description of structure, functions and responsibility of the Central bank's policy and how monetary policy and its tools affect the GDP and interest rates.</p> <p><b>CO 4:</b> Understanding the role and impact of international financial institutions on Indian economy.</p>

<b>Advanced Public Economics (ECON 603)</b>	<p><b>CO 1:</b> Description of major items of government revenue and expenditure and need for government interventions.</p> <p><b>CO 2:</b> Understanding the design of the tax structure using the concepts of efficiency and equity.</p> <p><b>CO 3:</b> Knowing the sources of market failure and potential policy options.</p> <p><b>CO 4:</b> Formulation of public budget. Understanding the principles of stabilisation policy.</p>
<b>Qualitative Development Policy Analysis (ECON 604)</b>	<p><b>CO 1:</b> Description of policy framework in the context of welfare maximization.</p> <p><b>CO 2:</b> Role of quantitative techniques in the failure of markets and rationale for government intervention.</p> <p><b>CO 3:</b> Understanding alternative approaches to demand supply analysis. Measurement of supply response through Nerlovian model.</p> <p><b>CO 4:</b> Conducting market equilibrium analysis in the context of price distortions and transaction costs impacting market efficiency and productivity.</p> <p><b>CO 5:</b> Knowing the concepts and uses of models in social accounting matrices and multipliers.</p>
<b>Agricultural Marketing and Price Analysis (ECON 605)</b>	<p><b>CO 1:</b> Getting deep insight of basic concepts of agricultural marketing viz; market structure, conduct and performance, the factors affecting marketable/ marketed surplus, the market integration, costs &amp; margins, the marketing efficiency, etc.</p> <p><b>CO 2:</b> Understanding the importance and operation of supply chain mechanism, the state trading, warehousing and other agencies. The role of ICT in the marketing of agricultural commodities.</p> <p><b>CO 3:</b> Application of quantitative methods for agricultural policy analysis in the context of price forecasting.</p>

	<p><b>CO 4:</b> Understanding the role of price policy in economic development; the operation mechanism of commodity markets and price discovery.</p>
<p><b>Advanced Agricultural Economics (ECON 606)</b></p>	<p><b>CO 1:</b> Understanding the history of agricultural development.</p> <p><b>CO 2:</b> Understandings the role of agricultural policies including new agricultural policy, 2019 in agricultural development.</p> <p><b>CO 3:</b> Knowing agriculture development in different countries under social, political and economic system.</p> <p><b>CO 4:</b> Learning impact of agricultural development on investment, capital formation &amp; employment.</p> <p><b>CO 5:</b> To understand the impact of institutional changes in agricultural development in India</p>
<p><b>Research Methodology (ECON 607)</b></p>	<p><b>CO 1:</b> Understanding the need and significance of research in social sciences. Demonstrating the research process.</p> <p><b>CO 2:</b> Getting acquittance on various methods of sampling, the data collection techniques through schedules and questionnaires.</p> <p><b>CO 3:</b> Acquiring competence in preparation of schedules, questionnaires and their pre-testing and final preparation.</p> <p><b>CO 4:</b> Understanding the formulations of hypothesis, application of tests for the significance of parameters.</p> <p><b>CO 5:</b> Learning documentation writing and its presentation.</p> <p><b>CO 6:</b> Acquiring capability in preparation of projects for funding from various agencies.</p>
<p><b>Econometrics ECON 608</b></p>	<p><b>CO 1:</b> Acquaintance with various statistical &amp; mathematical tools and techniques applied in economics and policy making.</p> <p><b>CO 2:</b> Demonstrating a familiarity with the properties and applications of several families of statistical distributions to econometric problems.</p>

	<p><b>CO 3:</b> Understanding the application of different functions/models and their usefulness in economics.</p> <p><b>CO 4:</b> Studying the relevant time series and panel data models for economic policy making and future forecasting.</p> <p><b>CO 5:</b> Learning the application of programme packages like SAS, RATS, SPSS, TSP, Win BUGS, EViews, etc to do analyses of empirical data.</p>
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## **Programme: Ph. D MANAGEMENT**

### **PROGRAMME OUTCOMES (POs)**

PO 1: This degree program is providing to students to study concepts and techniques needed to understand a range of business disciplines as well as to research issues arising in professional business practice.

PO 2: To provide students with the opportunity to learn the latest academic theories, concepts, techniques and applications with emphasis on teaching and research in the field of management.

PO 3: To extend the knowledge, expertise and skills of students through the application of research to business problems and issues by including internships, teaching experiences and special study projects as a part of the curriculum.

PO 4: To develop the student's ability to carry out independent research at an advanced level and enhance their ability to deliver their ideas, research methodology and findings using formal presentations with critiques of their analytical, written, oral and media presentation skills in business, professional and educational environments.

PO 5: To create opportunities for the University's bachelor and master's degree students to continue their business education by undertaking the doctoral degree course of students.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

PSO 1: Demonstrate advanced knowledge and competence in the latest academic theories, concepts, technology-enabled opportunities, financially justified analysis, research operations and market-based economy in a global field of business administration.

PSO 2: Demonstrate integration from business and non-business disciplines to generate novel ideas, strategies and practical approaches to address business issues faced by organizations.

PSO 3: Demonstrate effective research skills including formulation of research problem; integration of previous publications into an appropriate literature review, design of a research study, data analysis and ability to summarize and present the results.

PSO 4: Generate, evaluate and assess the ethical obligations and responsibilities of business for responsible management.

PSO 5: Demonstrate an ability to address complex industry challenges using the frameworks of industry rules and regulations that build prescriptive conclusions and real-world experience and knowledge.

Course	Course Outcomes (COs)
<b>1<sup>ST</sup> Semester</b>	
<b>(MGMT -601) Advances in Management thought</b>	CO1: Understand the concept and process of management. CO2: Understanding of management and its historical perspective. CO3: To delineate management functions and to understand the unique situation of management within research.
<b>(MGMT-602) Advances in Marketing Management</b>	CO1: Understanding of the Modern-day marketing functions in the corporate enterprises and various research and policy implications. CO2: Develop knowledge and understanding of the various aspects of modern marketing management. CO3: Enable students to identify research issues in the specialization area. CO4: Develop insight of students as to the area and topic in the area that they may work up to develop their Ph.D. proposals.
<b>(MGMT-603) Finance and Financial Markets</b>	CO1: Familiarize the students with advanced knowledge in the discipline of financial management. CO2: Knowledge of emerging issues and trends in financial markets and innovations in the financial sector. CO3: Practical knowledge along with the conceptual understanding of the subject. CO 4: Providing an international perspective in the field of management to the students.
<b>(MGMT-604) Advance Human Resource Management</b>	CO1: Understanding the advanced knowledge in the discipline of human resource management and integrating the steps necessary for effective implementation in the organization. CO2: Develop ways in which human resources management might diagnose a business strategy and then facilitate the internal change necessary to accomplish the strategy. CO3: Evaluate the developing role of human resources in the global arena.
<b>(MGMT-605) Global Business Environment</b>	CO1: Understanding the important linkages between the domestic economy and its external sector. CO2: Conceptual clarity of the theoretical aspects of international trade and finance. CO3: Examine the broad pattern of changes in the international economic policy. CO 4: Business implications of the international economic environment. CO 5: Knowledge about the basic macroeconomic relationships as they affect the behaviour of firms and to incorporate international issues in designing corporate strategies in a fast-changing environment.

<b>MGMT-699 Research Methodology</b>	<p>CO1: Understanding to Develop an understanding of various kinds of research, objectives of doing research, research process, research designs and sampling.</p> <p>CO2: Understanding the use of tools and techniques for exploratory, conclusive and causal research,</p> <p>CO 3: Understand the concept of measurement in empirical systems and its validity and reliability.</p> <p>CO4: Use of statistical techniques for analysis of research data and to realize the applications of Business research.</p> <p>CO4: Understanding to have a basic awareness of data analysis and hypothesis testing procedures.</p>
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## 2. PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Program Educational Objectives for B.Sc. (Hons. with Research) Microbiology program describe accomplishments that graduates are expected to attain.

PEO No.	Educational Objectives
<b>PEO1</b>	To develop a thorough understanding of key concepts, theories, and historical perspectives in microbiology across various domains for leading successful career in research, teaching or entrepreneurial endeavors.
<b>PEO2</b>	To develop the ability to critically think, analyze and make decisions for offering scientifically feasible and socially acceptable solutions to real-life problems in the areas of health, food safety and sustainable development.
<b>PEO3</b>	To enhance written and oral communication skills to effectively articulate microbiological concepts, research findings, and theoretical perspectives. Develop the ability to communicate with diverse audiences, including peers, researchers, scientists, and the general public.
<b>PEO4</b>	To gain hands-on experience through practicums, project, or research in academic settings or field exposure through visits to industrial production plants, clinical and diagnostic laboratories, food production units, biopharmaceutical units, research institutions, innovation/incubation centers.
<b>PEO5</b>	To demonstrate understanding of ethical guidelines and principles governing environmental sustainability by assessing the influence of biological education and research in community and ecological context.



### 3. GRADUATE ATTRIBUTES

Sl. No.	Attributes	Description
1.	Professional / Disciplinary Knowledge	Graduates will possess a comprehensive understanding of fundamental concepts, theories, and techniques within the field of microbiology.
2.	Laboratory / practical skills	Graduates will be proficient in various laboratory and practical skills and tools relevant to microbiology, including, designing experiments, administering interventions, and analyzing data.
3.	Communication skills	Graduates will demonstrate professional and effective verbal and written communication skills, enabling them to articulate microbiological concepts and findings to diverse audiences.
4.	Cooperation/Team work	Graduates will be adept at collaborating with colleagues and stakeholders, demonstrating the ability to work effectively as part of interdisciplinary teams in professional settings.
5.	Professional ethics	Graduates will uphold high standards of professional ethics and integrity, demonstrating awareness of ethical principles and guidelines governing microbiological teaching and research.
6.	Research / Innovation-related skills	Graduates will possess strong research and innovation skills, including the ability to design and execute research projects, critically evaluate research gaps, and contribute to the advancement of knowledge in the field of microbiology.
7.	Critical thinking and problem solving	Graduates will demonstrate advanced critical thinking skills, enabling them to analyze and evaluate microbiology concepts, research data and empirical evidences, as well as to develop innovative solutions to complex problems of the society.
8.	Reflective thinking	Graduates will engage in reflective practice, critically evaluating their own beliefs, assumptions, and professional practices, and using feedback to enhance their learning and professional development.
9.	Information/digital literacy	Graduates will be proficient in information and digital literacy skills, including the ability to access, and utilize information effectively and ethically using digital technologies and resources.
10.	Multi-cultural competence	Graduates will demonstrate cultural sensitivity and competence, recognizing and respecting individual and cultural diversity in microbiological theory, research, and industrial settings.
11.	Leadership readiness/qualities	Graduates will exhibit leadership readiness and qualities, including the ability to inspire others, facilitate change, and contribute in the greater benefits of humanity.
12.	Lifelong learning	Graduates will recognize the importance of lifelong learning, demonstrating a commitment to staying abreast of advancements in the field of microbiology and continuously improving their knowledge and professional skills throughout their careers.

## 5. PROGRAM OUTCOMES

On successful completion of B.Sc. (Hons. with Research) Microbiology programme, the students are expected to attain the following:

PO No.	Attribute	Competency
PO1	Professional knowledge	Acquire knowledge and gain understanding of concepts in microbiology, microbial diversity and their applications in research, food, agriculture, biopharmaceuticals, beverages, environment, healthcare and diagnostic industries along with specific benefits and challenges.
PO2	Practical/Technical skills	Demonstrate competency in routine and specialized microbiological laboratory skills applicable to microbiological research or clinical methods, including laboratory safety and accurately reporting observations and statistical data analysis.
PO3	Ethical values & professionalism	Adherence to ethical principles and codes of conduct in professional decision-making and demonstrate the ability to identify ethical issues related to biosafety and biohazards, genetic engineering, vaccines and intellectual property rights.
PO4	Communication	Communicate scientific concepts, experimental data and analytical arguments clearly and concisely, both verbally and in writing.
PO5	Evidence based practice/learning	Applying the knowledge acquired to undertake studies, analyze data and identify specific remedial measures for the challenges in health, environment, agriculture, and food sectors.
PO6	Life-long learning	Recognition of the importance of lifelong learning and professional development for maintaining competence and adapting to evolving concepts, technologies and trends in microbiology and allied sciences.
PO7	Entrepreneurship, leadership and mentorship	Capacity for innovation and entrepreneurship in developing and implementing microbiology start-ups, production units and service programs. Leadership skills for guiding and inspiring teams, advocating for the profession, and fostering collaboration within multidisciplinary settings.



## 6. PROGRAM SPECIFIC OUTCOMES

PSO No.	Competency
<b>PSO1</b>	To understand the diversity, characteristics and metabolic processes of microorganisms and demonstrate the skills in aseptic handling, isolation, characterization and maintenance of microorganisms.
<b>PSO2</b>	Demonstrate the ability to identify significant microbiological research questions, develop research protocols, and analyse research outcomes as per the scientific methods to improve the employment skills.
<b>PSO3</b>	To acquire proficiency in research design and methodology, including the ability to formulate research questions, design appropriate studies, and implement research methods, and analyze and interpret data using statistical methods through research projects in semester VII and VIII.
<b>PSO4</b>	Understand biochemical and molecular aspects of microbes and developing innovative solutions for present and future challenges related to environment, energy, food security, better health and biosafety.
<b>PSO5</b>	Possess strong communication and interpersonal skills, enabling them to collaborate effectively with colleagues, and communicate microbiological concepts and findings clearly and impressively to peers and scientific community.

<b>Name of College and Department</b>	Akal College of Basic Sciences, Department of Microbiology
<b>Name of the Program</b>	B.Sc. (Hons. with Research) Microbiology
<b>Course Code</b>	DSC-1
<b>Course Title</b>	<b>General Microbiology</b>
<b>Academic Year</b>	I
<b>Semester</b>	I

### Course Outcomes:

At the end of the course students will be able to:

<b>CO1</b>	Define microbiology, outline its goals, and explain the scope of microbiology.
<b>CO2</b>	Understand the characteristics, diversity and important roles of bacteria, archaea, fungi, algae, viruses, protozoa and other eukaryotic microorganisms.
<b>CO3</b>	Describe the principles of microbial control, disinfection, antiseptics and antimicrobials.
<b>CO4</b>	Understand the applications of microbes in human health, industries and environment.
<b>CO5</b>	Demonstrate laboratory skills in basic microbiological techniques.

### Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes:





<b>Name of College and Department</b>	Akal College of Basic Sciences, Department of Microbiology
<b>Name of the Program</b>	B.Sc. (Hons. with Research) Microbiology
<b>Course Code</b>	DSC-3
<b>Course Title</b>	<b>Microbial Ecology</b>
<b>Academic Year</b>	I
<b>Semester</b>	I

**Course Outcomes:**

At the end of the course, students will be able to:

<b>CO1</b>	Understand the diversity of microbes occupying a wide range of ecological habitats.
<b>CO2</b>	Acquire knowledge of microbial roles in biogeochemical cycling in different ecosystems.
<b>CO3</b>	Understand the microbe-microbe interactions and their importance in ecological balance.
<b>CO4</b>	Understand the role of microbes in agriculture, degradation and bioremediation.
<b>CO5</b>	Demonstrate laboratory skills in studying microbial habitats, microbial interactions and microbial processes in different ecosystems.

**Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	1	1	1	3	1	1	1	1
CO2	1	1	1	1	1	1	1	1	1	1	1	1
CO3	1	1	1	1	1	1	1	1	1	1	1	1
CO4	1	1	1	1	1	1	1	1	1	1	1	1
CO5	1	3	1	1	1	1	1	1	1	1	1	1

<b>Average</b>	<b>1.4</b>	<b>1.4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1.4</b>	<b>1</b>	<b>1</b>	<b>1</b>	<b>1</b>
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

<b>Name of College and Department</b>	Akal College of Basic Sciences, Department of Microbiology
<b>Name of the Program</b>	B.Sc. (Hons. with Research) Microbiology
<b>Course Code</b>	DSC-4
<b>Course Title</b>	<b>Phycology</b>
<b>Academic Year</b>	I
<b>Semester</b>	II

<b>Course Outcomes:</b> At the end of the course students will be able to:												
<b>CO1</b>	Know about diversity and significance of algae in different environments.											
<b>CO2</b>	Acquire knowledge of algae classification and important groups											
<b>CO3</b>	Understand the interactions of algae with other microbes, plant and animals.											
<b>CO4</b>	Know about commercial products obtained from different algal species.											
<b>CO5</b>	Demonstrate skills in isolation, identification and lab cultivation of algae.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	3	1	1	3	1	1	1	1
CO2	3	1	1	1	1	1	1	3	2	1	1	1
CO3	1	2	1	2	1	1	1	3	2	2	1	1
CO4	1	1	1	1	3	1	1	2	1	2	3	1
CO5	1	3	1	1	1	1	1	1	1	1	1	1
<b>Average</b>	<b>1.8</b>	<b>1.6</b>	<b>1.0</b>	<b>1.2</b>	<b>1.8</b>	<b>1.0</b>	<b>1.0</b>	<b>2.4</b>	<b>1.4</b>	<b>1.4</b>	<b>1.4</b>	<b>1.0</b>
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

<b>Name of College and Department</b>	Akal College of Basic Sciences, Department of Microbiology
<b>Name of the Program</b>	B.Sc. (Hons. with Research) Microbiology
<b>Course Code</b>	DSC-5
<b>Course Title</b>	<b>Virology</b>
<b>Academic Year</b>	I
<b>Semester</b>	II

<b>Course Outcomes:</b> At the end of the course students will be able to understand:												
<b>CO1</b>	Understand the chemical nature and type of viruses and sub-viral particles.											
<b>CO2</b>	Acquire knowledge on classification of viruses on the basis of different criteria.											
<b>CO3</b>	Understand the ultrastructural details of common viruses.											
<b>CO4</b>	Understand the life cycle, replication, host ranges, virus-host interactions.											
<b>CO5</b>	Acquire knowledge of methods of cultivation, isolation and purification of viruses.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs) &amp; Program Specific Outcomes:</b>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	1	1	1	3	1	1	2	1
CO2	2	1	1	1	1	1	1	1	1	1	1	1
CO3	2	2	1	1	1	1	1	1	1	1	1	1
CO4	2	1	1	1	1	1	1	1	1	1	1	1
CO5	2	3	1	1	2	1	2	1	1	1	1	1
Average	2.2	1.6	1	1	1.2	1	1.4	1.4	1	1	1.2	1
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

<b>Name of College and Department</b>	Akal College of Basic Sciences, Department of Microbiology
<b>Name of the Program</b>	B.Sc. (Hons. with Research) Microbiology
<b>Course Code</b>	DSC-6
<b>Course Title</b>	<b>Mycology</b>
<b>Academic Year</b>	I
<b>Semester</b>	II

[illegible]



## 2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The Program Educational Objectives for B.Sc. Life Sciences (Hons. with Research) program describe accomplishments that graduates are expected to attain.

No.	Education Objectives
<b>PEO1</b>	To provide students with a comprehensive education that integrates the fundamental principles and advance concepts of the three core disciplines of Botany, Chemistry and Zoology leading to successful career in research, teaching, or entrepreneurial endeavors.
<b>PEO2</b>	To strengthen one's capacity for critical thought, analysis, and decision-making in order to provide socially acceptable, practically verifiable, and scientifically sound answers to pressing issues pertaining to the biological, chemical, environmental, health and sustainable developmental issues.
<b>PEO3</b>	To enhance written and oral communication skills to effectively articulate biological, chemical, and biochemical aspects, research findings, and theoretical perspectives; and, to develop the ability to communicate with diverse audiences, including peers, researchers, scientists, and the general public.
<b>PEO4</b>	To gain hands-on experience through practicals, projects, or research in academic settings or field exposure through visits to Industrial Production Plants, Clinical and Diagnostic Laboratories, Zoological Parks, Museums, Wildlife Sanctuaries, Wetlands, Botanical and Medicinal Gardens, National Herbaria, Biopharmaceutical Units, Research Institutions, and Innovation/Incubation Centers.
<b>PEO5</b>	To foster personal growth, responsible citizenship and ethical conduct, the course component integrates health, wellness, and sports emphasizing holistic wellbeing across physical, emotional, social and spiritual dimensions.



### 3. GRADUATE ATTRIBUTES

Sl. No.	Attributes	Description
1	Professional / Disciplinary Knowledge	Graduates will gain a comprehensive understanding of fundamental concepts, theories, methodologies, and techniques within the field of Life Sciences.
2	Laboratory / Practical Skills	Graduates will be proficient in various laboratory and practical skills and tools relevant to Life Sciences, including, designing experiments, administering interventions, and analyzing data.
3	Communication Skill	Graduates will demonstrate professional and effective verbal and written communication skills, enabling them to articulate biological and chemical concepts and findings to diverse audiences.
4	Cooperation/Team Work	Graduates will be adept at collaborating with colleagues and stakeholders, demonstrating the ability to work effectively as part of interdisciplinary teams in professional settings.
5	Professional Ethics	Graduates will uphold high standards of professional ethics and integrity, demonstrating awareness of ethical principles and guidelines governing biological and chemical research, practice, and professional conduct.
6	Research / Innovation-related Skills	Graduates will possess strong research and innovation skills, including the ability to design and execute research projects, critically evaluate existing literature, and contribute to the advancement of knowledge in the field of Life Sciences and allied branches.
7	Critical Thinking and Problem Solving	Graduates will demonstrate advanced critical thinking skills, enabling them to analyze and evaluate biochemical concepts, research data and empirical evidences, as well as to develop innovative solutions to complex problems of the society.
8	Reflective Thinking	Graduates will engage in reflective thinking practice, critically evaluating their own beliefs, assumptions, and professional practices, and using feedback to enhance their learning and professional development.
9	Information/Digital Literacy	Graduates will be proficient in information and digital literacy skills, including the ability to access, evaluate, and utilize information effectively and ethically using digital technologies and resources.
10	Multi-cultural Competence	Graduates will demonstrate cultural sensitivity and competence, recognizing and respecting individual and cultural diversity.
11	Leadership Readiness/Qualities	Graduates will exhibit leadership readiness and qualities, including the ability to inspire and motivate others, facilitate change, and contribute positively to their profession and community.
12	Lifelong Learning	Graduates will recognize the importance of lifelong learning and professional development, demonstrating a commitment to staying abreast of advancements in the field of Life Sciences and continuously improving their knowledge and skills throughout their careers.

## 5. PROGRAM OUTCOMES

On successful completion of B.Sc. Life Sciences (Hons. with Research) program, the students are expected to attain the following:

No.	Attribute	Competency
PO1	Professional Knowledge	Ability to understand and apply foundational principles and theories of Life Sciences to real-world scenarios. Students are expected to learn the fundamental concepts, principles and processes underlying the academic field of Botany, Chemistry, and Zoology with allied sciences.
PO2	Clinical/ Technical Skills	Demonstrate competency in routine and specialized biological and chemical/ biochemical laboratory skills leading to foster their growth as a successful researcher and established as an entrepreneur in the field of their specialization.
PO3	Ethical Value & Professionalism	Adherence to ethical principles and codes of conduct in professional decision-making and demonstrate the ability to identify ethical issues related to bio-chemical safety and bio-chemical hazards, genetic engineering, tissue culturing and intellectual property rights. At the end of this program students will be able to develop internalise and exercise ethics in their professional as well as personal practices.
PO4	Communication	Students will be able to communicate scientific concepts, experimental data, and analytical arguments clearly and concisely, both orally and in writing.
PO5	Evidence based Practice/Learning	Applying the knowledge acquired to undertake studies, analyze data, and identify specific remedial measures for the challenges in biological systems, environment, industries, agriculture, food and other allied sectors.
PO6	Life-long Learning	Encourage them for the recognition of importance in life-long learning and professional development for maintaining competitiveness, self-sustainability, employability, adapting to evolving technologies and newer trends in Life Sciences.
PO7	Entrepreneurship, Leadership and Mentorship	Capacity for innovation and entrepreneurship in developing and implementing start-ups, production units and service programs. Leadership skills for guiding and inspiring teams, advocating for the profession, and fostering collaboration within multidisciplinary settings.



## 6. PROGRAM SPECIFIC OUTCOMES

PSO No.	Competency
PSO1	Graduates will gain a comprehensive understanding of biological and chemical principles across multiple levels of organization, integrating knowledge from Botany, Zoology, and Chemistry. They will be able to analyze complex biological systems, including interactions between organisms and their environments, using a multidisciplinary approach.
PSO2	Graduates will be proficient in a wide range of experimental techniques commonly used in botanical, zoological, and chemical research. They will possess practical skills in laboratory and fieldwork, including specimen collection and analysis, microscopy, molecular biology techniques, and chemical analysis, enabling them to conduct rigorous scientific investigations.
PSO3	Graduates will be adept at applying the scientific method to formulate hypotheses, design experiments, and interpret data in the context of botanical, zoological, and chemical research. They will be able to critically evaluate scientific literature, identify research gaps, and develop research questions to address fundamental and applied biological problems.
PSO4	To inculcate a scientific temperament in the students and create awareness of the impact of various courses of Life Sciences on the environment and society.
PSO5	By engaging in dissertations, academic projects, entrepreneurships students will utilize critical thinking, scientific approaches and scientific knowledge to design, execute, observe, and analyze results, thereby enhancing employment opportunities.

## DSC-1

<b>Name of the College (Department)</b>	Akal College of Basic Sciences (Department of Botany)
<b>Name of the Program</b>	B.Sc. Life Sciences (Hons. with Research)
<b>Course Code</b>	DSC – 1
<b>Course Title</b>	<b>Plant Diversity</b>
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4 (3+1)
<b>Course Prerequisite</b>	Students should have studied Biology at 10+2 level under Physics, Chemistry, Biology (PCB) scheme.
<b>Course Synopsis</b>	This course offers a comprehensive exploration of plant diversity, spanning from microorganisms like viruses and bacteria to higher plants such as algae, fungi, bryophytes, pteridophytes, and gymnosperms. Students will gain insights into the morphology, ecology, reproduction, and economic importance of these diverse plant groups.

**Course Outcomes:** At the end of the course students will be able to:

<b>CO1</b>	Will be able to understand the basic concept of microbes their structure and their economic importance.
<b>CO2</b>	Will be able to understand the basic information about the algae and their distribution. General characteristic and their economic importance.
<b>CO3</b>	Will be able to understand the basic information about the fungi, their ecological significance.
<b>CO4</b>	Will be able to understand the basic characteristic of bryophytes and their economic importance.
<b>CO5</b>	Will be able to understand the basic characteristic Ecological and economic importance of

	Pteridophytes and Gymnosperms
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Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:												
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	1	2	1	1	3	1	1	1	1	1	2	1
CO2	1	1	1	1	1	1	1	1	1	1	3	1
CO3	2	2	1	1	2	1	1	1	1	1	1	1
CO4	1	2	1	1	2	1	1	2	1	2	2	1
CO5	2	2	1	2	3	2	1	1	1	1	3	1
<b>Average</b>	<b>1.4</b>	<b>1</b>	<b>1</b>	<b>1.2</b>	<b>2.2</b>	<b>1.2</b>	<b>1</b>	<b>1.2</b>	<b>1</b>	<b>1.2</b>	<b>2.2</b>	<b>1</b>
1= Weak Correlation				2= Moderate Correlation				3= Strong Correlation				



**DSC-2**

<b>Name of the College (Department)</b>	Akal College of Basic Sciences (Department of Chemistry and Biochemistry)
<b>Name of the Program</b>	B.Sc. Life Sciences (Honours with Research)
<b>Course Code</b>	DSC-2
<b>Course Title</b>	<b>Basic Concepts of Organic Chemistry</b>
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4 (3+1)
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	Organic chemistry finds applications in pharmaceuticals, materials science, and agriculture, among others. Its interdisciplinary nature bridges biology, physics, and engineering, shaping diverse fields and innovations. This course will build a foundation and interest for organic chemistry as subject. Student will learn about the concept and antiquity of organic chemistry. Students will also acquire knowledge about different concepts of organic chemistry. This will help to develop the understanding and skills to think like organic chemist.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	Define organic chemistry, outline its goals, and explain the scope of organic chemistry in our daily life.
<b>CO2</b>	Understanding the fundamental concepts of stereochemistry.

<b>CO3</b>	Frame the mechanism of organic reactions by reminding and relating the fundamental properties of the reactants involved.											
<b>CO4</b>	Learn and identify many organic reactions.											
<b>CO5</b>	Differentiate electrophilic addition, nucleophilic addition, nucleophilic substitution, electrophilic substitution and rearrangement reactions.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	3	3	3	3	1	2	1	2	2	1	1
CO2	1	1	2	2	2	2	1	1.5	2	1	1.5	2
CO3	2	2	2	2	2	2	2	-	2	1	1	1
CO4	2	2	1	2	1	2	1	1.5	2	2	1.5	2
CO5	3	3	2	2	2	2	2	2	2	2	1	1
<b>Average</b>	<b>2.2</b>	<b>2.2</b>	<b>2</b>	<b>2.2</b>	<b>2</b>	<b>1.8</b>	<b>1.6</b>	<b>1.2</b>	<b>2</b>	<b>1.6</b>	<b>1.2</b>	<b>1.4</b>
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

### DSC-3

<b>Name of the College (Department)</b>	Akal College of Basic Sciences (Department of Zoology)
<b>Name of the Program</b>	B.Sc. Life Sciences (Hons. with Research)
<b>Course Code</b>	DSC-3
<b>Course Title</b>	<b>Non-Chordates-I</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	I
<b>Number of Credits</b>	4 (3+1)
<b>Course Prerequisite</b>	Students should have studied Biology at 10+2 level under Physics, Chemistry, Biology (PCB) scheme.
<b>Course Synopsis</b>	Non-Chordates-I course is intended for students to impart the knowledge of Invertebrates, such as Protozoa, Porifera, Coelenterata, Platyhelminthes, Aschelminthes, and Annelids. This course will build foundation and interest for Zoology as a subject. This course covers the detailed study including morphology, systemic position, distribution ecology, anatomy and economic importance of different animals that comes under different phylum. Practical skills are an essential part of Zoology. The experiments included in this course are intended to develop basic Zoological skills related to examination of cultures of Protozoa and specimen identification.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	To learn parasitic protozoans ( <i>Entamoeba</i> , <i>Giardia</i> , <i>Trypanosoma</i> and <i>Leishmania</i> ).
<b>CO2</b>	To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Porifera and Coelenterata.
<b>CO3</b>	To understand morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Platyhelminthes and Aschelminthes.
<b>CO4</b>	To learn morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Annelids.
<b>CO5</b>	Demonstrate laboratory skills in basic Zoological techniques including culturing, staining and slide preparations.

Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes (PSOs):												
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	3	2	1	1	1	1	1	2	1	1	1	1
CO2	1	1	1	1	1	1	1	3	1	1	1	1
CO3	2	2	1	1	2	1	1	1	1	1	1	1
CO4	2	2	1	1	1	1	1	2	2	1	2	1
CO5	3	2	1	2	2	2	1	3	1	1	1	1
Average	2.2	1	1	1.2	1.4	1.2	1	2.2	1.2	1	1.2	1
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

#### DSC-4

<b>Name of the College (Department)</b>	Akal College of Basic Sciences (Department of Botany)
<b>Name of the Program</b>	B.Sc. Life Sciences (Hons. with Research)
<b>Course Code</b>	DSC-4
<b>Course Title</b>	Angiosperm Taxonomy
<b>Academic Year</b>	I
<b>Semester</b>	II
<b>Number of Credits</b>	4 (3+1)
<b>Course Prerequisite</b>	Students should have studied subject of botany in semester I at UG level under multidisciplinary or honours program.
<b>Course Synopsis</b>	This course aims to provide students with a comprehensive understanding of plant taxonomy, from historical perspectives to modern techniques in classification, identification, and preservation. Through theoretical lessons and practical exercises, students will develop the skills necessary to study and classify plant species effectively.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	Understand the terminology and history of taxonomy.
<b>CO2</b>	Understand the principles and rules of ICN and understand the basic concept of palynology, cytology, phytochemistry in relation to taxonomy.
<b>CO3</b>	Understand the basic principles of Classification and identification.
<b>CO4</b>	Understand the herbarium techniques.
<b>CO5</b>	Understand the morphological and floral characters of different families.

<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO1	2	2	2	1	1	1	1	1	1	1	1	1
CO2	1	1	3	1	1	1	1	1	1	1	1	1
CO3	1.5	2	1	1	1	1	1	1	1	1	2	1
CO4	1	2	2	1	1	1	1	2	1	2	1	1
CO5	2.5	2	3	2	1	2	1	1	1	1	2	1
<b>Average</b>	<b>1.6</b>	<b>1</b>	<b>2.2</b>	<b>1.2</b>	<b>1</b>	<b>1.2</b>	<b>1</b>	<b>1.2</b>	<b>1</b>	<b>1.2</b>	<b>1.4</b>	<b>1</b>
1= Weak Correlation				2= Moderate Correlation				3= Strong Correlation				



**DSC-5**

[illegible]

CO4	2	2	2	2	2	2	2	2	2	2	2	2
CO5	3	3	2	2	2	2	2	2	2	2	2	1
<b>Average</b>	<b>2.2</b>	<b>2.2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
1= Weak Correlation				2= Moderate Correlation				3= Strong Correlation				



## 2. PROGRAM EDUCATIONAL OBJECTIVES (PEOs)

The Program Educational Objectives for **B.Sc. (Hons. with Research) Physical Sciences** program describe accomplishments that graduates are expected to attain.

PEO No.	Educational Objectives
PEO1	<b>Multidisciplinary Approach</b> To provide students with a comprehensive education that integrates the fundamental principles and advanced concepts of the three core disciplines of physics, chemistry, and mathematics with multiple entry and exit options.
PEO2	<b>Skill Enhancement</b> To learn practical abilities that they can use in real life, like problem-solving, communication, or technical skills for both personal growth and success in work or other areas of life.
PEO3	<b>Ability Enhancement</b> Understanding environmental importance, promoting informed action for ecosystem conservation, and enhancing sustainability, aiming to develop communication, discussion, and debate skills, giving priority to critical reading, academic writing, and cultural exploration, to achieve proficiency in modern Indian languages and English.
PEO4	<b>Research Orientation</b> To Encourage research methodology and project work, prepare students for academic and industry research, foster curiosity and critical thinking to advance knowledge and innovate in their fields, enhance problem-solving skills, and empower contributions to research activities.
PEO5	<b>Value Addition and Ethical Foundation</b> To foster personal growth, responsible citizenship, and ethical conduct, course components integrate health, wellness, and sports, emphasising holistic well-being across physical, emotional, social, and spiritual dimensions.



### 3. GRADUATE ATTRIBUTES

S.No.	Attributes	Description
1	Multidisciplinary Knowledge	Graduates will have a broad understanding of multiple core disciplines.
2	Critical Thinking	They will be equipped with the ability to think critically and solve complex problems.
3	Communication Skills	Effective communication skills will be a key attribute, both in professional and environmental contexts.
4	Ethical Conduct	Ethical behavior and responsibility in professional practices will be emphasized.
5	Lifelong Learning	The program fosters a commitment to lifelong learning for personal and professional development.
6	Leadership Qualities	Graduates will develop leadership skills that can be applied in various situations.
7	Teamwork	Graduates will be able to collaborate effectively, boosting creativity and productivity. Success will depend on trust, communication, and acceptance of differences to overcome obstacles and achieve goals.
8	Innovation and Creativity	The program encourages innovation and creativity in approaching challenges.
9	Global Perspective	A global perspective will be cultivated, preparing graduates for international environments.
10	Entrepreneurship	Entrepreneurial skills will be nurtured to enable graduates to create and manage new ventures.

## 5. PROGRAM OUTCOMES

On successful completion of the **B.Sc. (Hons. with Research) Physical Sciences** program, the students are expected to attain the following:

PO No.	Attribute	Competency
PO1	Multidisciplinary knowledge	Establish the comprehensive knowledge of theoretical and experimental aspects in three core discipline of Physical sciences.
PO2	Critical thinking and problem-solving skills	Cultivate critical thinking skills to identify, analyze, and solve diverse theoretical or experimental challenges, employing a scientific approach for knowledge development.
PO3	Analytical/Scientific reasoning and Research Skills	Utilize suitable techniques and procedures to innovate and tackle complex problems by applying evidence-based, clearly defined explanations, and explore the scientific reasoning behind the outcomes achieved. Plan and learn various techniques and software used for analysis and exploring research projects while keeping in mind the rules and regulations pertaining to different scientific research project operations.
PO4	Effective Professional Communication Skills, Social Interaction and Effective Citizenship	Showcase expertise through technical writings and oral presentations in the scientific community and broader society. Foster science-society dialogue by sharing insights at diverse platforms like symposia, workshops, and science fairs, contributing voluntarily to societal development.
PO5	Multicultural Competency, Leadership Readiness and Entrepreneurship	Work effectively either independently or as a team leader while being adaptable to various multicultural competencies and understanding the importance and strengths of interacting with and working alongside people from diverse backgrounds. Capacity for innovation and entrepreneurship in developing and implementing start-ups, production units and service programs.

PO6	Ethics, Environment and Sustainability	Acquire a thorough understanding of ethical principles within scientific endeavors, ensuring adherence to principles of integrity and honesty. Employ methodologies that prioritize safety and sustainability in scientific pursuits, thereby contributing to global betterment.
PO7	Self-directed and Life-long Learning	Develop a habit of continuous self-learning via various online/offline educational platforms, including retention of the same and nurturing critical thinking skills, further, use them to update scientific knowledge and apply them in day-to-day life and business.

## 6. PROGRAM SPECIFIC OUTCOMES

PSO No.	Competency
<b>PSO1</b>	Students will gain a strong foundation in the core subjects of Physics, Chemistry, and Mathematics, enabling them to understand and apply basic principles and concepts in daily life.
<b>PSO2</b>	To gain understanding and core knowledge in the physical sciences, including the major premises of algebra, calculus, differential equations, numerical techniques, statistics; analytical, inorganic, organic & physical chemistry; classical mechanics, modern physics, material science, nanotechnology and renewable energy.
<b>PSO3</b>	Through laboratory courses in the physical sciences, students will develop hands-on skills in conducting experiments, analysing data, and using scientific instruments and software.
<b>PSO4</b>	To inculcate a scientific temperament in the students and create awareness of the impact of various courses in physical sciences on the environment and society.
<b>PSO5</b>	By engaging in dissertations, academic projects, or entrepreneurship, students will utilize critical thinking, systematic approaches, and scientific knowledge to design, execute, observe, and analyze results, thereby enhancing employment opportunities.



<b>Name of the College (Department)</b>	<b>Akal College of Basic Sciences (Department of Mathematics)</b>
<b>Name of the program</b>	<b>B.Sc. (Hons. with Research) Physical Sciences</b>
<b>Course Code</b>	
<b>Course Title</b>	<b>Algebra</b>
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	--
<b>Course Synopsis</b>	This course covers properties and applications of matrices including symmetric, skew symmetric, Hermitian, and skew Hermitian matrices. It explores elementary operations on matrices and their use in solving systems of linear equations, along with theorems on consistency. Additionally, topics include eigenvalues, eigenvectors, characteristic equations, and their applications, as well as solutions and nature of roots of polynomial equations, including methods for solving cubic and biquadratic equations.
<b>Course Outcomes:</b> At the end of the course, students will:	
<b>CO1</b>	Mastery of Matrix Theory: Students will gain a comprehensive understanding of matrix operations, including different types of matrices and their properties.
<b>CO2</b>	Applications of Matrices: Students will learn to apply matrices to systems of linear equations, solving both homogeneous and non-homogeneous equations.
<b>CO3</b>	Understanding of Eigenvalues and Eigenvectors: Students will be able to calculate and interpret eigenvalues and eigenvectors and use them in various mathematical contexts.





<b>Name of the College (Department)</b>		<b>Akal College of Basic Sciences (Department of Physics)</b>										
<b>Name of the Program</b>		<b>B.Sc. (Hons. with Research) Physical Sciences</b>										
<b>Course Code</b>												
<b>Course Title</b>		<b>Mechanics</b>										
<b>Academic Year</b>		I										
<b>Semester</b>		I										
<b>Number of Credits</b>		4										
<b>Course Prerequisite</b>		Physics and Mathematics syllabus of class XII										
<b>Course Synopsis</b>		This course reviews the concepts of mechanics learnt at school from a more advanced perspective and goes on to build new concepts. It begins with dynamics of a system of particles and ends with the special theory of relativity. Students will appreciate the concept of rotational motion, gravitation and oscillations. The students will be able to apply the concepts learnt to several real-world problems.										
<b>Course Outcomes:</b> At the end of the course students will be able to:												
<b>CO1</b>	Understand about the vectors and ordinary differential equations in terms of operator method and their utility in mechanics											
<b>CO2</b>	Explain the dynamics of a system of particles, centre of mass and determine of centre of mass for discrete and continuous systems having spherical symmetry. Differentiate the conservative & non-conservative forces and elastic & in-elastic collisions.											
<b>CO3</b>	Describe rotational and oscillatory motion. Apply theorem of parallel and perpendicular axes (statements only) and calculate moment of inertia of discrete and continuous systems.											
<b>CO4</b>	Explain the Newton's Law of Gravitation, motion of a particle in a central force field, Kepler's laws of planetary motion											
<b>CO5</b>	Define the frame of references and explain the concept of Lorentz, Galilean transformations, Michelson-Morley experiment, length contraction, time dilation, relativistic transformation of velocity and relativistic variation of mass.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	3	3	3	3	1	1	3	3	2	2	1
<b>CO2</b>	2	3	2	2	2	2	1	3	3	2	1	2
<b>CO3</b>	3	2	2	2	2	2	2	2	2	1	1	1
<b>CO4</b>	3	1	1	2	1	2	2	2	2	2	2	2
<b>CO5</b>	3	3	2	2	2	2	2	2	2	2	2	1
<b>Avg.</b>	<b>2.8</b>	<b>2.4</b>	<b>2</b>	<b>2.2</b>	<b>2</b>	<b>1.8</b>	<b>1.6</b>	<b>2.4</b>	<b>2.4</b>	<b>1.8</b>	<b>1.6</b>	<b>1.4</b>
1= Weak Correlation				2= Moderate Correlation				3= Strong				



<b>Name of the College (Department)</b>	<b>Akal College of Basic Sciences (Department of Mathematics)</b>
<b>Name of the Program</b>	<b>B.Sc. (Hons. with Research) Physical Sciences</b>
<b>Course Code</b>	
<b>Course Title</b>	<b>Calculus</b>
<b>Academic Year</b>	I
<b>Semester</b>	II
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	Student completed 10+2 level with mathematics as one subject.
<b>Course Synopsis</b>	This course focuses on learning differential calculus by visualizing functions. We'll cover limits, continuity, derivatives, finding areas, volumes of shapes, force, and work. You'll also learn important formulas and methods for integrating different functions with one or more variables.
<b>Course Outcomes:</b> At the end of the course students will be:	
<b>CO1</b>	Students will be able to apply limit and continuity concepts to examine the behavior of different functions, calculate differentiability of functions, and approximate functions using series expansions.
<b>CO2</b>	Students will be able to know the behavior of curves, identify asymptotes, compute curvature, of different curves in Cartesian, parametric and polar coordinates.
<b>CO3</b>	Students will understand the geometric properties of various types of curves in Cartesian and polar coordinate.
<b>CO4</b>	Students will be able to trace curves accurately in Cartesian, parametric, and polar coordinates, apply reduction formulae to simplify integrals, calculate arc lengths using rectification techniques, and understand the concept of intrinsic equations and their applications in curve analysis.
<b>CO5</b>	Students will calculate curve-bounded areas, volumes, and surface areas using

	integration techniques.											
Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	2	2	2	1	2	1	2	2	3	1	1	1
CO2	3	3	3	1	2	1	2	3	3	2	1	2
CO3	3	3	3	1	2	1	2	3	3	2	1	2
CO4	2	3	3	1	2	1	2	3	3	2	1	2
CO5	2	3	3	1	2	1	2	3	3	2	1	2
Avg.	2.4	2.8	2.8	1	2	1	2	2.8	3	1.8	1	1.8
1= Weak Correlation				2 = Moderate Correlation				3 = Strong Correlation				

[illegible]



<b>4</b>												
<b>CO 5</b>	3	3	2	2	2	2	2	2	2	2	2	1
<b>Avg .</b>	<b>2.2</b>	<b>2.2</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>3</b>	<b>2</b>	<b>2</b>	<b>2</b>	<b>3</b>
1= Weak Correlation				2= Moderate Correlation				3= Strong Correlation				

Name of the College (Department)		Akai College of Basic Sciences (Department of Physics)										
Name of the Program		B.Sc. (Hons. with Research) Physical Sciences										
Course Code												
Course Title		Electricity and Magnetism										
Academic Year		I										
Semester		II										
Number of Credits		4										
Course Prerequisite		Physics and Mathematics syllabus of class XI & XII										
Course Synopsis		This course reviews the concepts of electromagnetism learnt at school from a more advanced perspective and goes on to build new concepts. The course covers static and dynamic electric and magnetic fields due to continuous charge and current distributions respectively.										
Course Outcomes: At the end of the course students will be able to:												
CO1	Apply Coulomb’s law to line, surface, and volume distributions of charges; and Apply Gauss’s law of electrostatics to distribution of charges											
CO2	Solve boundary value problems using method of images											
CO3	Comprehend the genesis of multipole effects in arbitrary distribution of charges											
CO4	Understand the effects of electric polarization and concepts of bound charges in dielectric materials.											
CO5	Calculate the vector potential and magnetic field of arbitrary current Distribution. Understand the impact of time-varying magnetic and electric fields in order to comprehend the formulation of Maxwell’s equations											
Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes:												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	3	3	3	3	1	1	3	3	1	2	1
CO2	2	3	2	2	2	2	1	3	3	2	1	2
CO3	3	2	2	2	2	2	2	2	2	2	1	1
CO4	3	1	3	2	2	2	2	2	2	2	2	2
CO5	3	3	1	2	2	2	2	2	2	2	2	1
CO6	3	3	1	2	3	2	2	3	2	2	2	3
Avg.	2.8	2.5	2.0	2.2	2.3	1.8	1.7	2.5	2.3	1.8	1.7	1.7
1= Weak Correlation												

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

Program Outcomes	Program Outcome of B.Sc. (Hon's) Mathematics
PO1.	Graduating with Honours in Mathematics allows to be eligible for M.Sc. in Mathematics program.
PO2.	Brief knowledge in Mathematics and understanding of research area in mathematics or statistics.
PO3.	Developed the confidence and ability to work independently and be able to recognize a given real world mathematical problem in which domain of mathematics it falls.
PO4.	Learned to evaluate relevant literature and incorporate it appropriately when introducing the background to a piece of work
PO5.	Developed the ability to communicate technical ideas effectively, both in writing and also in an oral or in writing presentation
PO6.	They will be able to write computer program in C Language and be able to apply in solving real world problem
PO7.	They will be able to formulate and solve mathematical model of a real-world problem.
PO8.	Completion of the Honours program should also enhance job prospects.
Program Specific Outcomes	<b>PSOs of B.Sc. (H) Mathematics Program</b>
PO1.	Demonstrate proficiency in writing proofs
PO2.	Investigate and apply mathematical problems and solutions in a variety of contexts related to science, technology, business and industry, and illustrate these solutions using symbolic, numeric, or graphical methods
PO3.	Investigate and solve unfamiliar math problems

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

Course Outcomes	<b>Algebra (MATH-122)</b> CO 01: Students will be able to recognize different type of Matrices. CO 02: They will be able to find out Eigen Values and Eigen Vectors CO 03: Students will be able to solve system of linear equations. CO 04: Students will be able to apply the knowledge of solving cubic and biquadrate equations in practical problems. CO 05: Students will know the property of bilinear and quadratic forms.
Credits	LTP:3/1/0
Course Outcomes	<b>Calculus (MATH-123)</b> CO 01: Students will be able to understand limit, continuity, and able to apply differentiation in different type practical problems. CO 02: They understand different properties of curves. CO 03: Students will be able to draw different type Cartesian and polar curves. CO04: Students will be able to know how to calculate area, volume and length of different shapes.
Credits	LTP:3/0/1
Course Outcomes	<b>Advanced Calculus (MATH-211)</b> CO 01: Student understand the concept of Continuity, Sequential continuity, properties of continuous functions uniform continuity CO 02: Understand the basic knowledge of Chain rule of differentiability, Mean value theorems Rolle's theorem and Lagrange's mean value theorem and their geometrical interpretations. CO 03: Application of Taylor's theorem with various form of remainders, Darboux intermediate value theorem for derivatives Indeterminate forms. CO 04: Basic idea of Limit and continuity of real valued functions of two variables, Partial differentiation, Total differentials, Composite functions and implicit functions, change of variables, CO 05: Application of Homogeneous functions and Euler's theorem on homogeneous functions. CO 06: Application Taylor's theorem for functions of two variables Differentiability of real valued functions of two variables, CO 07: Learn about Implicit function theorem, Maxima, Minima and saddle points of two variables, Lagrange's method of multipliers Curves, CO 08: Learn about Tangents, Principal normal, Binomials, Serret-Frenet formulas,

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	Locus of the centre of curvature, Spherical curvature, Locus of centre of spherical CO 09: Learn about curvature, Involutives, Evolutes, Bertrand curves, Surfaces, Tangent planes, one parameter family of surfaces.
Credits	TP:3/1/0
Course Outcomes	<b>Linear Algebra (MATH-212)</b>  CO 01: Student will be able to apply basic arithmetic operations on vectors and matrices, including inversion and determinants, using technology where appropriate; CO 02: Able to solve systems of linear equations, using technology to facilitate row reduction; CO 03: Know the basic terminology of linear algebra in Euclidean spaces, including linear independence, spanning, basis, rank, nullity, subspace, and linear transformation; CO 04: The abstract notions of vector space and inner product space; CO 05: Able to find eigenvalues and eigenvectors of a matrix or a linear transformation, and using them to diagonalize a matrix; CO 06: projections and orthogonality among Euclidean vectors, including the Gram-Schmidt orthonormalization process and orthogonal matrices;
Credits	LTP:3/1/0
Course Outcomes	<b>Ordinary Differential Equation (MATH-213)</b>  CO 01: They will be able to solve homogeneous and non-homogeneous linear differential equation and its application. CO 02: They will be able to solve different type differential equations. CO 03: students will be able to apply Variation of Parameter for solving differential equations. CO 04: students will be able to apply Method of Undetermined Coefficient for solving differential equations. CO 05: They will be able to apply Lagrange's Method for solving linear differential equation.
Credits	LTP:3/0/1
Course Outcomes	<b>Mathematical Modeling - I (MATH-214)</b>  CO 01: Student understand about Equilibrium point, node, saddle points, focus Centre with examples and figures.



**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	<p>CO 02: Students learn about linearization of non-linear problems.</p> <p>CO 03: Students learn about Modeling of blood flow, oxygen transfer in red cells and other mathematical formulations of real-life problems.</p> <p>CO 04: Formulation and Analysis of Single species model, Logistic model.</p> <p>CO 05: Understand the two-competing species Lotaka-Volterra models and its analysis.</p> <p>CO 06: Formulation and analysis of different type epidemic models.</p> <p>CO 07: Through this course students learn about different type real life mathematical models and their analysis.</p>
Credits	LTP:3/0/1
Course Outcomes	<p><b>Boolean algebra (MATH-215)</b></p> <p>CO 01: Student will learn about fundamentals of set theory.</p> <p>CO 02: Student will learn Lattice theory.</p> <p>CO 03: Student will learn logic gate and switching circuits and its applications</p>
Credits	LTP:3/1/0
Course Outcomes	<p><b>Numerical Methods (MATH-221)</b></p> <p>CO 01: Explain the consequences of finite precision and the inherent limits of the numerical methods considered.</p> <p>CO 02: Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.</p> <p>CO 03: Demonstrate they understand the mathematics concepts underlying the numerical methods considered.</p> <p>CO 04: Demonstrate understanding and implementation of numerical solution algorithms applied to the following classes of problems:</p> <p>CO 05: Student will be able to apply different numerical techniques to solve real world problems through programming in C.</p>
Credits	LTP:3/0/1
Course Outcomes	<p><b>Sequence and Series (MATH-222)</b></p> <p>CO 01: Students will be able to understand different characteristics of set theory.</p> <p>CO 02: At the end of this course the students will be able to apply the convergence and divergence of a given series by using different tests.</p>

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	CO 03: Students will be able to understand about arbitrary series and their condition of convergence and divergence.
Credits	LTP:3/1/0
Course Outcomes	<b>Solid Geometry (MATH-223)</b> CO 01: They will be able to recognize different type of three-dimensional geometric objects. CO 02: They will be able to understand basic three-dimensional objects like plane, sphere, conicoid and different type equations of these objects. CO 03: They will be able to transform objects from one system to another.
Credits	LTP:3/1/0
Course Outcomes	<b>Vector Calculus (MATH-224)</b> CO 01: They understand about scalar, vectors and their different properties. CO 02: They will be able to apply different type operators in practical problems. CO 03: They will be able to solve vector integration, CO 04: Students will be able to apply Greens, Stokes and Divergence theorem. CO 05: Students will be able to transform problems from one system to another.
Credits	LTP:3/1/0
Course Outcomes	<b>Mathematical Modeling -II (MATH-225)</b> CO 01: Students will learn behavior of fluid flow. CO 02: Student will understand the behavior of heat flow in different geometries. CO 03: Student will understand the behavior of application of wave equation CO 04 Student will be able to formulate mathematical models in electrical circuit theory.
Credits	LTP:3/0/1
Course Outcomes	<b>Groups and Rings (MATH-311)</b> CO 01: Students will be able to understand different type of theorems in algebra. CO 02: students will be able to apply Group, Ring and Field theory in practical applications.

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	<p>CO 03. They apply the knowledge of Groups and Rings in coding theory, quantum mechanics and many other fields.</p> <p>CO 04: They understand about Unique Factorization Domain, Euclidean Domain and Principle Ideal Domain.</p>
Credits	LTP:3/1/0
Course Outcomes	<p><b>Partial Differential Equations (MATH-312)</b></p> <p>CO 01: They will understand basic knowledge of Partial Differential Equations.</p> <p>CO 02: Most of the real-world problems are formulated in Mathematical models, which are formulated in the form of partial differential equations.</p> <p>CO 03: They will be able incorporate this knowledge in mathematical models.</p> <p>CO 04: They will be able to classify partial differential equations and change into canonical form.</p> <p>CO 05: Students will be able to solve one- and two-dimensional Heat equation, Wave equation and Laplace equations.</p>
Credits	LTP:3/0/1
Course Outcomes	<p><b>Real Analysis (MATH-313)</b></p> <p>CO 01: They understand about basic idea of integration of functions.</p> <p>CO 02: They will be able to understand application of Mean value theorems.</p> <p>CO 03: students will be able to analyze convergence and divergence of improper integrals through different tests.</p> <p>CO 04: Students will apply this knowledge in boundedness, finite intersection property, compactness, connectedness, components, continuity in relation with continuity in relation connectedness in Metric Space.</p>
Credits	LTP:3/1/0
Course Outcomes	<p><b>Special functions and Integral Transforms (MATH-314)</b></p> <p>CO 01: Students will be able to apply series solution method to solve practical problems of differential equations</p> <p>CO 02: students will understand the application of Laplace; inverse Laplace transform and Fourier transforms.</p> <p>CO 03: They will recognize and solve different type differential equations.</p> <p>CO 04: Students will be able to apply convolution theorem.</p>

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

Credits	LTP:3/1/0
Course Outcomes	<b>Statics (MATH-315)</b> CO 01: They understand about static forces and its resolution. CO 02: They understand about equilibrium of forces. CO 03: They apply the knowledge of friction, Centre of gravity, virtual work in real life situation. CO 04: They will understand about Stable and unstable equilibrium position. CO 05: Students will be able to apply the knowledge of forces in three dimensions.
Credits	LTP:3/1/0
Course Outcomes	<b>Combinatorial Mathematics (MATH-316)</b> CO 01: Student will learn basic counting principle. CO 02: Student will learn Recurrence relation and Generating function. CO 03: Student will learn Polya's counting theory.
Credits	LTP:3/1/0
Course Outcomes	<b>Multivariate calculus (MATH-317)</b> CO 01: Student will be able to understand point set topology. CO 02: Student will be able to learn linear transformation from $R^m$ to $R^n$ . Student will learn Riemann Integral and its properties. Student will learn Lebesgue's integral and its properties.
Credits	LTP:3/0/1
Course Outcomes	<b>Graph Theory (MATH-318)</b> CO 01: Student will be able to understand basic properties of graph and trees. CO 02: Student will learn Walk path and circuit. CO 03: Student will be able to solve Travelling salesman problem though graph path and circuit.
Credits	LTP:3/1/0
Course Outcomes	<b>Automata Theory (MATH 319)</b> CO 01: Student will learn Finite Automata.



**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	CO 02: Student will be able to understand Languages and Grammar. CO 03: Student will learn Turing Machines.
Credits	LTP:3/1/0
Course Outcomes	<b>Portfolio optimization (MATH-320)</b> CO 01: Student will learn financial markets and types of risk and mutual funds. CO 02: Student will be able to understand Mean Variance Portfolio optimization techniques. CO 03: Student will learn capital market theory and security market lines.
Credits	LTP:3/1/0
Course Outcomes	<b>Industrial Mathematics (MATH330)</b> CO 01: Students will be able to medical imaging and inverse problems based on the calculus. CO02: Students will learn about X-Ray behavior Radon transform and back projection. CO 03: They will learn Fourier and Inverse Fourier transform and their properties in image reconstructions.
Credits	LTP:3/1/0
Course Outcomes	<b>Bio Mathematics (MATH-326)</b> CO 01: Students will be able to understand mathematical biology and their modelling process. CO02: Students will learn about the different epidemic models. CO 03: They will learn spatial and discrete models.
Credits	LTP:3/1/0
Course Outcomes	<b>Applied Statistics (MATH-331)</b> CO 01: Students will be able analyse time series and index number. CO02: Students will learn Statistical Quality Control. CO 03: They will learn to measure mortality rate, standardize death rate.
Credits	LTP:3/1/0
Course Outcomes	<b>Cryptography and Network security (MATH-328)</b> CO 01: Students will be able to understand Cryptography principles and its applications.

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	CO02: Students will be able to understand Network attacks and IP spoofing. CO 03: Students will be able to understand IP security architectures.
Credits	LTP:3/1/0
Course Outcomes	<b>History of Mathematics (MATH-329)</b> CO 01: Students will be able to learn various branches of mathematics. CO02: Students will be able to understand geometry and history of ancient mathematics (Hindu and Arabic). CO03: Students will be able to understand geometry and history of Greek mathematics.
Credits	LTP:4/0/0
Course Outcomes	<b>Statistics (MATH-311)</b> CO 01: Students will be able to analyze the raw data. CO02: Students apply the concept of sampling theory. CO 03: They will apply different type of tests like chi square test, t-test, Z-test and F- tests, CO 04: They will be able to apply correlation and regression in practical problems. CO 05: They will understand different type of distributions such as Normal, Binomial, Poisson.
Credits	LTP:3/1/0
Course Outcomes	<b>Linear Programming (MATH - 322)</b> CO 01: Student will understand about formulation of Linear Programming problem and its graphical solution. CO 02: They will analyze the basic property of convex and concave functions. CO 03: Student will understand about solution of Linear programming problem by Simplex method. CO 04: They will apply the big M- Technique, The two-phase method, Principle of duality in linear programming problem. CO 05: Student will be able to solve Transportation and Assignment problems.
Credits	LTP:3/1/0
Course Outcomes	<b>Dynamics (MATH321)</b> CO01: Basic terminologies of Dynamics

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	<p>CO02: Understand General motion of a rigid body, and apply in practical problems</p> <p>CO03: Able ability to apply knowledge of Dynamics in science and engineering</p> <p>CO04: Be proficient in the use of mathematical methods to analyze the forces and motion a system.</p> <p>CO05: Be able to identify, formulate, and solve science and engineering problems.</p>
Credits	LTP:3/1/0
Course Outcomes	<p><b>Number theory and trigonometry (MATH-323)</b></p> <p>CO 01: Students will gain the knowledge about g.c.d, l.c.m., fundamental theorem of arithmetic, linear congruence, Fermat's theorem, Wilson's theorem.</p> <p>CO 02: Students will gain the knowledge about the area complete residue system, Euler's theorem, Fermat's theorem, Chinese remainder theorem, gauss lemma.</p> <p>CO 03: Students will apply their knowledge in the field of greatest integer function, Moebius function, Moebius inversion formula.</p> <p>CO 04: Students will get the knowledge in the area De-Moivre's theorem, trigonometric function, hyperbolic function.</p> <p>CO 05: Students will get the knowledge in the area inverse circular and hyperbolic function, logarithmic of a complex quantity Gregory's series.</p>
Credits	LTP:3/1/0
Course Outcomes	<p><b>Programming in C and Numerical Techniques (MATH-324)</b></p> <p>CO 01: Student will understand about the basic concept of C language.</p> <p>CO 02: They will apply C language in solution of different practical problems.</p> <p>CO 03: Students will be able to solve problems through programming in C and also handling functions</p> <p>CO 04: They will solve linear and nonlinear problems using C language.</p> <p>CO 05: They will be able to solve Integration, and solution of ordinary differential equations with C programming.</p>
Credits	LTP:3/0/1
Course Outcomes	<p><b>Real and complex analysis (MATH-325)</b></p> <p>CO 01: Students will get the knowledge about the area Jacobians, beta and gamma functions, double and triple integral</p> <p>CO 02: Students will get the knowledge in the field Fourier series, Fourier transform, half range series.</p>

**Courses Offered by Department of Mathematics for Program Outcome of B.Sc.  
(Hon's) Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	<p>CO 03: Students will get the knowledge in the field of stereographic projection of complex number, continuity and differentiability of complex function, analytic function, and harmonic function.</p> <p>CO 04: Students will gain the knowledge in the area of conformal mapping, mobius transformation, fixed points, critical mapping.</p>
<b>Credits</b>	LTP:3/0/1



## **Programme: B.Sc. Medical (Three-year degree program)**

### **PROGRAMME OUTCOMES (POs)**

**PO 1:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO 2:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 3:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PO 4:** Apply appropriate techniques, resources using computer software skills, models, IT tools to solve complex problems with an understanding of the limitations.

**PO 5:**, and demonstrate the knowledge of, and need for sustainable development.

**PO 6:** Demonstrate ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.

**PO 7:** Communicate effectively on complex activities with the scientific community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO1:** Students will be able to clearly understand the concepts and applications in the field of Physics, Chemistry and Mathematics along with Environment and Management, Social and Professional Ethics and Computer Applications.

**PSO2:** Students have the capability to grasp the technological advancements in the usage of physical science to analyse and design techniques/methods for a variety of applications.

**PSO3:** Students will be capable for placement opportunities and to pursue career oriented higher education in an interdisciplinary area in India as well as abroad in the practice of Project, Aptitude and Management and Leadership.

**PSO 4:** Students will be able to develop and demonstrate knowledge of statistical tools used in sciences.

**PSO 5:** Learners can also acquire practical skills to work as chemist, faculty and other industrial supporting services.

### COURSE OUTCOMES (COs)

<b>B.Sc. Medical First Semester</b>	
<b>Course</b>	<b>Course Outcomes (COs)</b>
Basic Communication Skills (ENG-101)	CO1: To learn basic about English language and its importance in global commutation. CO2: Develop skills to read and write poems, essays and short stories. CO3: To know how to make effective sentences and use of grammar.
Introduction to Computer Applications (COMP-101)	CO1: To know basic applications of computers in different organizations. CO2: Understanding, types of Computer systems like Micro, Mini, Mainframe and Super Computers. CO2: To know about input and output devices, Data Processing and storage.
Basic Organic Chemistry (CHEM-111)	CO1: To understand the basic concepts of Organic Chemistry. CO2: Learn about different type of reagents and reaction intermediates used in chemical reactions. CO3: Get familiarize with the initial concepts of stereochemistry with special emphasis on optical isomerism, relative and absolute configurations. CO4: Acquire knowledge regarding geometrical isomerism and conformational isomerism. CO5: Gather information pertaining to the synthesis and chemical reactions of alkanes and cycloalkanes. CO 6: Develop the understanding of practical knowledge and apply them in experiments.
Ecology and Environmental Biology (ZOO-111)	CO 1: To equip the students with basic concepts of ecology and environment science such as ecosystem, community, population etc. CO 2: Students should know about environment biome, biosphere, ecosphere and ecological succession. CO 3: To facilitate the students about biotic and abiotic components of the ecosystem and relationships between them. CO 4: Introduction to major ecosystems of the world and effects of climate change on them.
Evolutionary Biology (ZOO-112)	CO 1: Students should know about the evolution of complex organic molecule from complex inorganic compounds and formation of photobionts (first primitive cell). CO 2: Equip the students about patterns of similarities and differences among living beings over time and across habitats through action of biological processes such as natural selection, mutation and genetic drift. CO 3: Students should learn about phylogeny and evolutionary history of horse and man. CO 4: Students should know about geological time scales, eras, epochs and evolution of various animal groups in these ages.
Algae (BOT-111)	CO1. Understand the diversity among Algae. CO2. Know the systematic, morphology and structure, of Algae. CO3. Understand the life cycle pattern of Algae. CO4. Understand the useful and harmful activities of Algae.

Fungi (BOT-112)	CO1. Understand the Biodiversity of Fungi CO2. Know the Economic Importance of Fungi CO3. Understand the morphological diversity of Fungi.
<b>B.Sc. Medical Second Semester</b>	
Basic Inorganic Chemistry (CHEM-121)	CO1: To learn importance of de Broglie matter waves, Schrodinger wave equation and some important basic principles of atomic structure. CO2: To understand the principle of atomic, ionic radii, ionization energy, and electron affinity and electron negativity. CO3: To learn about chemical bonding, VBT theory, and hybridization and VSEPR theory. CO4: To understanding the chemical bonding and Molecular orbital theory. CO5: To understanding the ionic structures, radius ratio effects and coordination numbers.
Environmental Science (EVS-301)	CO1: To understand the need for public awareness for environment. CO2: To learn about renewable and non-renewable resources, problems associated with Natural resources. CO3: To know about ecosystems, structure and function of an ecosystem. CO4: Understand biodiversity and impact on environment, conservations of bio resources. CO5: Environmental pollution and causes and remedies.
Basic Zoology (ZOO-101)	CO 1: Students should learn the basics of Zoology, characteristics of living organisms. Description of typical plant and animal cells, DNA, RNA, mitotic and meiotic cell divisions. CO 2: Students should learn zoological nomenclature and principles of classification of non-chordates. CO 3: Students should learn systematic position of chordates. CO 4: learn fundamental anatomy and physiology of various systems of chordates.
Cell Biology (BIOCHEM-121)	CO 1: Understand basic aspects of prokaryotic and eukaryotic cells, cell theory and classification of cells and molecular composition of cells. CO 2: To learn about cell cycle and its phases, cell membrane structure and models pertaining to it. Membrane proteins and carbohydrates and their role; transport across membranes. CO 3: To know about cell organelles and in depth study of their structure and functions. Cytoskeleton, types and their functions. CO 4: Learn about cancer: its development and causes, types, properties, early detection and treatment.
Genetics (PBG-101)	CO1: To understand basic about elements of heredity and variation CO2: To learn Chromosomes and Heredity CO3: To know about Gene Interactions and modified dihybrid ratios. CO4: To understand Mutations and mutagens, role of induced mutations in crop improvement and monitoring environmental mutagens. CO5: To understand structure and biosynthesis of RNA and DNA; DNA as genetic material; transformation, transduction.
Bryophytes	CO1. Understand the morphological diversity of Bryophytes.

(BOT-121)	CO2. Understand the economic importance of the Bryophytes. CO3. Understand the life cycle of Bryophytes.
Pteridophytes (BOT-122)	CO1. Understand the morphological diversity of Pteridophytes. CO 2. Understand the economic importance of the Pteridophytes. CO 3. Know the evolution of Pteridophytes.
<b>B.Sc. Medical Third Semester</b>	
Basic Physical Chemistry (CHEM-211)	CO1: Student will learn about gaseous state of matter, postulates of Kinetic theory of gases, critical phenomenon. CO2: To understand qualitative discussion of the Maxwell's distribution of molecular velocities and liquefaction of gases. CO3: To learn basic about chemical kinetics and its scope, factors influencing the rate of a reaction-concentration CO4: To understand the importance of second law of thermodynamics with statements, Carnot cycle and its efficiency, some important thermodynamic parameters in thermodynamics and their variation. CO5: To learn the physical significance of Free energy and work function, their variation with temperature and pressure, Maxwell relation and third law of thermodynamics.
Human Values and Ethics (EDU-101)	CO1: Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being. CO2: To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order CO3: To learn about Professional ethics and issues in professional ethics.
Punjabi Lazmi (PBI-111)	CO: To learn basic about the Punjabi language, writing and speaking.
Diversity of Non chordates– I (ZOO-211)	CO 1: Introduction to parasitic protozoans of man ( <i>Entamoeba</i> , <i>Giardia</i> , <i>Trypanosoma</i> and <i>Leishmania</i> . CO 2: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the cnidarian. CO 3: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the aschelminthes. CO 4: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Platyhelminthes.
Diversity of Chordates –I (ZOO-213)	CO 1: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Protochordates. CO 2: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Cyclostomata. CO 3: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Chondrichthyes.



	CO 4: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Actinopterygii.
Comparative Anatomy of Chordates –I (ZOO-313)	CO 1: To know about Integumentary System. CO 2: To know about Skeletal System. CO 3: To know about Muscle System. CO 4: To know about respiratory and digestive system.
Gymnosperm (BOT-211)	CO 1. Understand the morphological diversity of Gymnosperms. CO 2. Understand the economic importance of the Gymnosperms. CO 3. Know the evolution of Gymnosperms.
Systematics of Angiosperms (BOT-212)	CO1. Understand the habit of the angiosperm plant body. CO2. Know the vegetative characteristics of the plant. CO3. Learn about the reproductive characteristics of the plant. CO4. Understand the plant morphology and basic taxonomy.
<b>B.Sc. Medical Fourth Semester</b>	
Inorganic Chemistry-III (CHEM-221)	CO1: To learn importance of hydrides of nitrogen, nitrogen halides, oxides and oxyacid. CO2: To understand the principle of chemical reactivity and dioxygen as a ligand (basic idea only), structure of O <sub>3</sub> and H <sub>2</sub> O <sub>2</sub> , clathrate hydrates allotropic forms of S & Se, structures of halides. CO3: To learn about the halogen Family (chemical reactivity, group trends, chemistry of preparation of fluorine, hydrogen halides. CO4: To understanding the symmetry, group theory symmetry elements and symmetry operations. CO5: To understanding the properties of irreducible representations and character tables.
Physical Chemistry-III (CHEM-222)	CO1: To enhance scientific knowledge in kinetic theory of gases, understand transport properties and some important laws of diffusions. CO2: To understand thermodynamics of diffusion, relation between transport properties. CO3: To learn basic about equilibrium electrochemistry, some important laws, theories and application of conductometric titrations. CO4: To know dynamic electrochemistry, processes at electrodes, double layer at the interface, applications of dynamic electrochemistry in power generation, power storage (batteries). CO5: To enhance knowledge about chemical, kinetics of complex reactions, Importance of catalysts in kinetics.
Diversity of Non Chordates–II (ZOO-221)	CO 1: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Arthropoda. CO 2: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Echinodermata. CO 3: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Mollusca.

	CO 4: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the hemichordata.
Diversity of Chordates –II (ZOO-222)	CO 1: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the amphibia. CO 2: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the reptilia. CO 3: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the aves. CO 4: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Mammalia.
Plant Physiology (BOT-221)	CO1. Know importance and scope of plant physiology. CO 2. To understand the plants and plant cells in relation to water. CO 3. Understand the process of photosynthesis in higher plants with particular emphasis on light and dark reactions, C3 and C4 pathways. CO 4. Understand the respiration in higher plants with particular emphasis on aerobic and anaerobic respiration. CO 5. Learn about the movement of sap and absorption of water in plant body.  CO 6. Understand the plant movements.
Embryology of Angiosperms (BOT-222)	CO1. Know the methods of pollination and fertilization. CO2. Know fertilization, endosperm and embryogeny. CO3. Understand the process of sporogenesis and embryogenic development.
Plant development & anatomy (BOT-223)	CO1. Understand the scope & importance of Anatomy. CO2. Know various tissue systems. CO3. Understand the normal and anomalous secondary growth in plants and their causes. CO4. Perform the techniques in anatomy.
<b>B.Sc. Medical Fifth Semester</b>	
Inorganic Chemistry-IV (CHEM-311)	CO1: To learn importance of coordination compounds, classical ligands, non-classical ligands and multidentate ligands. CO2: To understand the concept of isomerism in coordination compounds, nomenclature and stability of coordination compounds. CO3: To learn about the valence bond theory for bonding in coordination compounds, concept of multiple bonding, strength and weaknesses of valence bond approach. CO4: To understanding the splitting of d-orbitals in different fields for example octahedral and tetrahedral complexes. CO5: To understanding the concept of thermodynamic effects of crystal field splitting and enthalpies of hydration of M <sup>2+</sup> ions.
Organic	CO 1: Learn the synthesis and chemical reactions of nitrogen and

Chemistry-IV (CHEM-313)	<p>organosulphur compounds.</p> <p>CO 2: Develop the understanding of five and six membered heterocyclic compounds along with condensed five and six membered heterocyclic.</p> <p>CO 3: Recognize the importance and chemistry of saccharides, disaccharides and polysaccharides.</p> <p>CO 4: Understand the difference between fats and oil, soaps and detergents and get acquainted with the synthesis of synthetic dyes.</p> <p>CO 5: To know the chemistry related to amino acids, peptides, proteins and nucleic acids.</p> <p>CO 6: Practice to perform single and multi-step organic reactions.</p>
Developmental Biology (ZOO-312)	<p>CO 1: To know about gametogenesis with particular reference to differentiation of spermatozoa and vitellogenesis.</p> <p>CO 2: To know about fertilization and metamorphosis.</p> <p>CO 3: Fate maps of chick and frog embryos.</p> <p>CO 4: Mammalian placenta—its formation, types and functions.</p>
Applied Zoology (ZOO-315)	<p>CO 1: To know about useful animals and their products.</p> <p>CO 2: To know about important human and veterinary parasites—protozoan and helminths.</p> <p>CO 3: To know about Arthropods and vectors of human diseases and their mode of transmission.</p> <p>CO 4: Biology and control of chief insect pests, birds and mammals of agricultural importance.</p>
Phytopathology (BOT-313)	<p>CO1. Know the terminologies in plant pathology.</p> <p>CO2. Understand the scope and importance of Plant Pathology.</p> <p>CO3. Know the prevention and control measures of plant diseases and its effect on economy of crops.</p>
Plants Ecology & Environment (BOT-314)	<p>CO1. Understand the ecological concepts as well as the ability to apply ecological knowledge to manage and remediate environmental problems.</p> <p>CO2. To apply systems concepts and methodologies to analyse and understand interactions between social and environmental processes.</p> <p>CO3. To understand the bio-geochemical cycles &amp; ecological successions.</p>
Plants and Human Welfare (Economic Botany) (BOT-315)	<p>CO1. Understand the role plants in human welfare.</p> <p>CO2. Gain knowledge about various plants of economic use.</p> <p>CO3. Know importance of plants &amp; plant products.</p> <p>CO4. Understand the chemical contents of the plant products.</p> <p>CO5. Know about the utility of plant resources.</p>
<b>B.Sc. Medical Sixth Semester</b>	
Physical Chemistry-V (CHEM-322)	<p>CO1: To learn importance of quantum mechanics, failure of classical concepts and some important basic principles of quantum mechanics.</p> <p>CO2: To understand the behaviour of particle in one and three dimensional box with translational energy, energy levels, quantization of energy and applications of particle in a box model.</p> <p>CO3: To learn about angular momentum, approximate Methods, operators used in quantum mechanics.</p>

	CO4: Developing understanding for Valence-bond and molecular orbital approaches, electronic structures and pi-electron approximation.
Organic Chemistry-V (CHEM-323)	CO1: To learn importance of acyclic molecules, conformation, steric stereo electronic effects and enantiomeric relationships. CO2: To understand the concept of free radical, carbanion nucleophile substitution reaction mechanism and regioselectivity. CO3: To learn about the alkylation of aldehydes, Favorskii rearrangements and aldol condensations. CO4: To understanding the concept of photochemistry, Jablonski diagram, inter-system crossing singlet and triplet states.CO5: To understanding the concept of concerted reactions, unimolecular rearrangement and elimination reactions.
Comparative Anatomy of Non-Chordates (ZOO-321)	CO 1: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the Protozoan. CO 2: To know about morphology, anatomy, systematic position, morphology, distinctive characters, distribution ecology and economic importance of the important parasitic protozoans. CO 3: General organisation, Comparative account of canal system, skeletal system, reproduction and development of sponges. CO 4: Corals and coral formation, polymorphism and affinities of the group
Comparative Anatomy of Chordates –II (ZOO-322)	CO 1: To know about sense organs. CO 2: To know about circulatory system. CO 3: To know about nervous system CO 4: To know about urinogenital system and reproductive system
Plant Biotechnology (BOT-322)	CO1. Gain knowledge about the mechanism and essential component required for prokaryotic DNA replication. CO2. Understand the fundamentals of Recombinant DNA Technology. CO3. Know about the Genetic Engineering. CO4. Understand the principle and basic protocols for Plant Tissue Culture. CO5. The concept of operon and its structure and regulation.
Plant breeding and crop improvement (BOT-323)	CO1. Understand the science of plant breeding. CO 2. To introduce the student with branch of plant breeding for the survival of human being from starvation. CO3. To study the techniques of production of new superior crop varieties. CO4. Understand the modern strategies applied in plant breeding for crop improvement i.e. Mass selection, Pure line Selection and Clonal selection.



## **Programme: B.Sc. Non-Medical (Three-year degree programme)**

### **PROGRAMME OUTCOMES (POs)**

**PO 1:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

**PO 2:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO 3:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

**PO 4:** Apply appropriate techniques, resources using computer software skills, models, IT tools to solve complex problems with an understanding of the limitations.

**PO 5:**, and demonstrate the knowledge of, and need for sustainable development.

**PO 6:** Demonstrate ethical principles and commit to professional ethics and responsibilities and norms of the scientific practice.

**PO 7:** Communicate effectively on complex activities with the scientific community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO1:** Students will be able to clearly understand the concepts and applications in the field of Physics, Chemistry and Mathematics along with Environment and Management, Social and Professional Ethics and Computer Applications.

**PSO2:** Students have the capability to grasp the technological advancements in the usage of physical science to analyse and design techniques/methods for a variety of applications.

**PSO3:** Students will be capable for placement opportunities and to pursue career oriented higher education in an interdisciplinary areas in India as well as abroad in the practice of Project, Aptitude and Management and Leadership.

**PSO 4:** Students will be able to develop and demonstrate knowledge of statistical tools used in sciences.

**PSO 5:** Learners can also acquire practical skills to work as chemist, faculty and other industrial supporting services.

### COURSE OUTCOMES (COs)

<b>B.Sc. Non-Medical First Semester</b>	
<b>Course</b>	<b>Course Outcomes (COs)</b>
Mechanics (PHY-111)	<p>CO1: Develop an understanding of Mathematical Tools: Partial differential equations, vector algebra, integration, differentiation, spherical polar co-ordinates.</p> <p>CO2: Explain the law of conservation of Energy, Conservative forces, internal forces and conservation of linear momentum, centre of mass, internal torque.</p> <p>CO3: Describe elastic and inelastic scattering, laboratory and centre of mass systems, scattering cross-section, Rutherford scattering.</p> <p>CO4: Explain angular momentum, moment of inertia, radius of gyration, Euler's equation.</p> <p>CO5: Clearly define the inverse square law, gravitational force, gravitational and electrostatic self-energy.</p>
Basic Communication Skills (ENG-101)	<p>CO1: To learn basic about English language and its importance in global commutation.</p> <p>CO2: Develop skills to read and write poems, essays and short stories.</p> <p>CO3: To know how to make effective sentences and use of grammar.</p>
Introduction to Computer Applications (COMP-101)	<p>CO1: To know basic applications of computers in different organizations.</p> <p>CO2: Understanding, types of Computer systems like Micro, Mini, Mainframe and Super Computers.</p> <p>CO2: To know about input and output devices, Data Processing and storage.</p>
Basic Organic Chemistry (CHEM-111)	<p>CO1: To understand the basic concepts of Organic Chemistry.</p> <p>CO2: Learn about different type of reagents and reaction intermediates used in chemical reactions.</p> <p>CO3: Get familiarize with the initial concepts of stereochemistry with special emphasis on optical isomerism, relative and absolute configurations.</p> <p>CO4: Acquire knowledge regarding geometrical isomerism and conformational isomerism.</p> <p>CO5: Gather information pertaining to the synthesis and chemical reactions of alkanes and cycloalkanes.</p> <p>CO 6: Develop the understanding of practical knowledge and apply them in experiments.</p>
Electricity and Magnetism - I (PHY-112)	<p>CO1: Develop an understanding and use of mathematical tools: complex numbers, complex plane, Euler's formula, power numbers etc.</p> <p>CO2: Develop an understanding of Vector Calculus: Differentiation of vectors, curl of a vector field and its physical significance, Stokes' theorem, combination of grad, div and curl.</p> <p>CO3: Develop an understanding of Conservation and quantization of charge, Coulomb's Law, Energy of a system of charges. Flux and Gauss's law. Brief review of electric fields of a spherical charge distribution.</p>

	<p>CO4: Clearly define the electric potential: Potential as line integral of field, potential difference, gradient of a scalar function, Gauss's theorem and differential form of Gauss's law, Laplacian and Laplace's equation, Poisson's equation</p> <p>CO5: Develop an understanding of electric fields and electric current, general electrostatic problems, uniqueness theorem, charge transport and current density, energy dissipation in current flow, variable currents in capacitors and resistors.</p>
Physics Laboratory - I (PHY-113)	<p>CO1: Able to use Vernier callipers, Screw gauge, Spherometer.</p> <p>CO2: Explain the concept of simple pendulum and moment of inertia.</p> <p>CO3: Classify the Young's modulus, modulus of rigidity.</p> <p>CO4: Able to use sextant to measure dimensions of unknown objects.</p> <p>CO5: Explain Coefficient of viscosity of a given liquid by Stoke's method. Study its temperature dependence.</p>
<b>B.Sc. Second Semester</b>	
Electricity and Magnetism – II (PHY-122)	<p>CO1: Describe dielectrics, moments of a charge distribution, Potential and field of a dipole, Atomic and molecular dipoles, Induced dipole moments.</p> <p>CO2: Explain magnetic forces, measurement of a charge in motion, invariance of charge, Electric field measured in different frames of reference.</p> <p>CO3: Describe and explain magnetic field, vector field and hall effect.</p> <p>CO4: Explain the concept of electromagnetic induction, mutual inductance and impedance.</p> <p>CO5: Describe the external field, electron spin, magnetic moment and magnetic susceptibility.</p>
Physics Laboratory – II (PHY-123)	<p>CO1: Explain B-H curves for different ferromagnetic materials using C.R.O.</p> <p>CO2: Explain the concept low inductance by Maxwell-Wein bridge.</p> <p>CO3: Describe the temperature coefficient of resistance of Cu.</p> <p>CO4: Explain the functioning and working of He-Ne laser.</p> <p>CO5: Understanding of photoelectric effect, photocell.</p>
Basic Inorganic Chemistry (CHEM-121)	<p>CO1: To learn importance of de Broglie matter waves, Schrodinger wave equation and some important basic principles of atomic structure.</p> <p>CO2: To understand the principle of atomic, ionic radii, ionization energy, and electron affinity and electron negativity.</p> <p>CO3: To learn about chemical bonding, VBT theory, and hybridization and VSEPR theory.</p> <p>CO4: To understanding the chemical bonding and Molecular orbital theory.</p> <p>CO5: To understanding the ionic structures, radius ratio effects and coordination numbers.</p>
Calculus (MATH-123)	<p>CO1: Students will be able to understand limit, continuity, and able to apply differentiation in different type practical problems.</p>

	<p>CO2: They understand different properties of curves.</p> <p>CO3: Students will be able to draw different type Cartesian and polar curves.</p> <p>CO4: Students will be able to know how to calculate area, volume and length of different shapes.</p>
Algebra (MATH-122)	<p>CO1: Students will be able to recognize different type of Matrices.</p> <p>CO2: They will be able to find out Eigen Values and Eigen Vectors</p> <p>CO3: Students will be able to solve system of linear equations.</p> <p>CO 4: Students will be able to apply the knowledge of solving cubic and biquadrate equations in practical problems.</p> <p>CO5: Students will know the property of bilinear and quadratic forms.</p>
Special Theory of Relativity (PHY-121)	<p>CO1: Explain the Lorentz force, motion of charges particles in uniform constant electric field in uniform alternating electric field and in uniform magnetic field.</p> <p>CO2: Describe inertial and non-inertial frames of references, absolute and relative velocity and acceleration, fictitious force, collisions.</p> <p>CO3: Explain Michelson-Morley Experiment, Basic postulates of special relativity, Lorentz transformations, length contraction and time dilation.</p> <p>CO4: Describe Conservation of Momentum, Relativistic momentum, Relativistic Energy, Transformation of Momentum and Energy, Equivalence of Mass and Energy.</p> <p>CO5: Explain acceleration by a Transverse Electric field, charged particle in a magnetic field, centre of mass system and Threshold Energy. Energy available from Moving charge, Antiproton Threshold, Photo production of mesons.</p>
Environmental Science (EVS-301)	<p>CO1: To understand the need for public awareness for environment.</p> <p>CO2: To learn aboutv renewable and non-renewable resources, problems associated with Natural resources.</p> <p>CO3: To know about ecosystems, structure and function of an ecosystem.</p> <p>CO4: Understand biodiversity and impact on environment, conservations of bio resources.</p> <p>CO5: Environmenal pollution and causes and remedies.</p>
<b>B.Sc. Third Semester</b>	
Vibrations and Waves (PHY-211)	<p>CO1: Describe dielectrics, moments of a charge distribution, Potential and field of a dipole, Atomic and molecular dipoles, Induced dipole moments.</p> <p>CO2: Explain magnetic forces, measurement of a charge in motion, invariance of charge, Electric field measured in different frames of reference.</p> <p>CO3: Describe and explain magnetic field, vector field and hall effect.</p> <p>CO4: Explain the concept of electromagnetic induction, mutual inductance and impedance.</p>



	CO5: Describe the external field, electron spin, magnetic moment and magnetic susceptibility.
Electronics and Network Theory – I (PHY-212)	CO1: Describe the Series and parallel addition of V-I characteristics, KCL and KVL, Mesh and Node analysis, Superposition theorem, Thevenin's and Norton's theorem. CO2: Understanding of Band diagram, Mobility and conductivity, generation and recombination of charges, Diffusion, CO3: Describe the pnp and npn junction transistors, transistor current components, CB, CC and CE configurations, CO4: Describe Diode and transistor based clipping and clamping circuits, clamping circuit theorem. CO5: Explain the concept of Rectifiers, Filter circuits, efficiency, Ripple factor, voltage multiplying circuits.
Physics Laboratory – III (PHY-213)	CO1: Describe the working of Ge, Si, LED and Zener diode. CO2: Understand the concept of voltage regulation and ripple factor. CO3: Classify the common emitter and common base transistors. CO4: Describe high resistance by leakage method. CO5: Explain the laws of probability and radioactivity.
Basic Physical Chemistry (CHEM-211)	CO1: Student will learn about gaseous state of matter, postulates of Kinetic theory of gases, critical phenomenon.  CO2: To understand qualitative discussion of the Maxwell's distribution of molecular velocities and liquefaction of gases.  CO3: To learn basic about chemical kinetics and its scope, factors influencing the rate of a reaction-concentration  CO4: To understand the importance of second law of thermodynamics with statements, Carnot cycle and its efficiency, some important thermodynamic parameters in thermodynamics and their variation.  CO5: To learn the physical significance of Free energy and work function, their variation with temperature and pressure, Maxwell relation and third law of thermodynamics.
Statistics (STAT-311)	CO 1: They understand about static forces and its resolution. CO 2: They understand about equilibrium of forces. CO 3: They apply the knowledge of friction, Centre of gravity, virtual work in real life situation. CO4: They will understand about Stable and unstable equilibrium position. CO5: Students will be able to apply the knowledge of forces in three dimension.
Advanced Calculus (MATH-211)	CO1: Student understand the concept of Continuity, Sequential continuity, properties of continuous functions uniform continuity CO2: Understand the basic knowledge of Chain rule of differentiability, Mean value theorems Rolle's theorem and Lagrange's mean value theorem and their geometrical interpretations. CO3: Application of Taylor's theorem with various form of remainders, Darboux intermediate value theorem for derivatives Indeterminate forms.

	<p>CO4: Basic idea of Limit and continuity of real valued functions of two variables, Partial differentiation, Total differentials, Composite functions and implicit functions, change of variables,</p> <p>CO5: Application of Homogeneous functions and Euler's theorem on homogeneous functions.</p> <p>CO6: Application Taylor's theorem for functions of two variables Differentiability of real valued functions of two variables,</p> <p>CO7: Learn about Implicit function theorem, Maxima, Minima and saddle points of two variables, Lagrange's method of multipliers Curves,</p> <p>CO8: Learn about Tangents, Principal normal, Binomials, Serret-Frenet formulas, Locus of the center of curvature, Spherical curvature, Locus of center of spherical</p> <p>CO9: Learn about curvature, Involutives, Evolutes, Bertrand curves, Surfaces, Tangent planes, one parameter family of surfaces.</p>
Ordinary Differential Equations (MATH-213)	<p>CO1: They will be able to solve homogeneous and non-homogeneous linear differential equation and its application.</p> <p>CO2: They will be able to solve different type differential equations.</p> <p>CO3: students will be able to apply Variation of Parameter for solving differential equations.</p> <p>CO4: students will be able to apply Method of Undetermined Coefficient for solving differential equations.</p> <p>CO5: They will be able to apply Lagrange's Method for solving linear differential equation.</p>
Human Values and Ethics (EDU-101)	<p>CO1: Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being.</p> <p>CO2: To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order</p> <p>CO3: To learn about Professional ethics and issues in professional ethics.</p>
Punjabi Lazmi (PBI-111)	CO: To learn basic about the Punjabi language, writing and speaking.
<b>B.Sc. Fourth Semester</b>	
Electromagnetic Theory (PHY-221)	<p>CO1: Describe the Maxwell's equations, wave equation, e.m. waves in a medium with finite <math>\epsilon</math> and <math>\mu</math>, Plane waves, Energy flux.</p> <p>CO2: Explain the plane harmonic waves, linear, circular and elliptical polarization, natural light, production of polarized light, Malus law.</p> <p>CO3: Describe the theory of interference. Young's double slit experiment, Fresnel's Biprism, displacement of fringes</p> <p>CO4: Explain the Michelson's interferometer with its working principle.</p> <p>CO5: Explain Helmholtz Kirchhoff's integral, scalar diffraction theory, Fraunhofer diffraction: single slit, circular aperture, diffraction grating, Rayleigh's criterion for resolution.</p>
Quantum Mechanics and Statistical	<p>CO1: Describe the mathematical tools and origin of quantum theory related phenomenon.</p> <p>CO2: Explain foundation of wave mechanics and physical interpretation of Schrödinger equation.</p>

Physics (PHY-224)	<p>CO3: Describe basic Ideas of statistical physics and probability and its applications.</p> <p>CO4: Describe Maxwell-Boltzmann Statistics and related problems.</p> <p>CO5: Explain Bose-Einstein and Fermi-Dirac Statistics and related problems.</p>
Physics Laboratory – IV (PHY-225)	<p>CO1: Describe the specific rotation, refractive index, resolving power.</p> <p>CO2: Explain ionization potential of mercury.</p> <p>CO3: Classify the thermal conductivity and thermal diffusivity.</p> <p>CO4: Able to Measurement of the electrical and thermal conductivity of copper</p> <p>CO5: Explain the G M Counter, Stefan's Constant of radiation and temperature dependence of refractive index.</p>
Numerical Methods (MATH-221)	<p>CO1: Explain the consequences of finite precision and the inherent limits of the numerical methods considered.</p> <p>CO2: Select appropriate numerical methods to apply to various types of problems in engineering and science in consideration of the mathematical operations involved, accuracy requirements, and available computational resources.</p> <p>CO3: Demonstrate they understand the mathematics concepts underlying the numerical methods considered.</p> <p>CO4: Demonstrate understanding and implementation of numerical solution algorithms applied to the following classes of problems:</p> <p>CO5: Student will be able to apply different numerical techniques to solve real world problems through programming in C.</p>
Vector Calculus (MATH-224)	<p>CO1: They understand about scalar, vectors and their different properties.</p> <p>CO2: They will be able to apply different type operators in practical problems.</p> <p>CO3: They will be able to solve vector integration,</p> <p>CO4: Students will be able to apply Greens, Stokes and Divergence theorem.</p> <p>CO5: Students will be able to transform problems from one system to another.</p>
Inorganic Chemistry-III (CHEM-221)	<p>CO1: To learn importance of hydrides of nitrogen, nitrogen halides, oxides and oxyacid.</p> <p>CO2: To understand the principle of chemical reactivity and dioxygen as a ligand (basic idea only), structure of <math>O_3</math> and <math>H_2O_2</math>, clathrate hydrates allotropic forms of S &amp; Se, structures of halides.</p> <p>CO3: To learn about the halogen Family (chemical reactivity, group trends, chemistry of preparation of fluorine, hydrogen halides).</p> <p>CO4: To understanding the symmetry, group theory symmetry elements and symmetry operations.</p> <p>CO5: To understanding the properties of irreducible representations and character tables.</p>
Physical Chemistry-III (CHEM-222)	<p>CO1: To enhance scientific knowledge in kinetic theory of gases, understand transport properties and some important laws of diffusions.</p>

	<p>CO2: To understand thermodynamics of diffusion, relation between transport properties.</p> <p>CO3: To learn basic about equilibrium electrochemistry, some important laws, theories and application of conductometric titrations.</p> <p>CO4: To know dynamic electrochemistry, processes at electrodes, double layer at the interface, applications of dynamic electrochemistry in power generation, power storage (batteries).</p> <p>CO5: To enhance knowledge about chemical , kinetics of complex reactions, Importance of catalysts in kinetics.</p>
<b>B.Sc. Fifth Semester</b>	
Condensed Matter Physics (PHY-313)	<p>CO1: Describe the Lattice, basis and primitive cell, Symmetry operations, Bravais lattices in two and three dimensions, Index system for crystal planes.</p> <p>CO2: Explain the Reciprocal Lattice, Miller indices, Brillouin zone of sc, fcc and bcc lattices, Experimental diffraction methods, Bragg diffraction, scattered wave amplitude.</p> <p>CO3: Describe the Cohesive energy and bulk modulus in inert gas and ionic crystal, Binding in metallic, covalent and H-bonded crystals (basic ideas only). Lattice Vibrations: Dynamics of monatomic and diatomic linear chains, optical and acoustic modes,</p> <p>CO4: Explain the Fermi Gas of non-interacting electrons, heat capacity of electron gas, electrical conductivity, Ohm's Law, Hall Effect, thermal conductivity and Pauli Paramagnetism.</p> <p>CO5: Explain and describe Bloch functions, Kronig-Penney model, bands in metals, semi-metals, semiconductors and insulators, Fermi surface-basic idea.</p>
Nuclear Physics (PHY-314)	<p>CO1: Develop an understanding of nuclear masses, nuclear mass formula, stability of nuclei, Nuclear Properties and Binding Energy.</p> <p>CO2: Enumerate and explain the Radioactive decays; Modes of decay of radioactive nuclides and decay Laws, chart of nuclides and domain of instabilities.</p> <p>CO3: Develop an understanding of Alpha decay: Stability of heavy nuclei against break up, Geiger-Nuttall law, barrier penetration as applied to alpha decay, reduced widths, deducing nuclear energy levels.</p> <p>CO4: Clearly define the Types of nuclear reactions, cross-sections, Types of nuclear reactions, reactions cross section, conservation laws, Kinematics of nuclear reaction</p> <p>CO5: Enumerate and explain nuclear shell Model and Magic Numbers</p>
Physics Laboratory – V (PHY-316)	<p>CO1: Describe the flashing and quenching of neon and argon bulb.</p> <p>CO2: Explain the hall coefficient and mobility of given semiconductor.</p> <p>CO3: Classify the Q-factor for different resistances.</p> <p>CO4: Understand the concept of clipping and clamping circuits.</p> <p>CO5: Explain and identify the series and parallel LCR circuits.</p>



	CO6: Able to describes law of conservation of linear momentum in collision with initial momentum, using air track.
Partial Differential equations (MATH-312)	CO1: They will understand basic knowledge of Partial Differential Equations. CO2: Most of the real-world problems are formulated in Mathematical models, which are formulated in the form of partial differential equations. CO3: They will be able incorporate this knowledge in mathematical models. CO4: They will be able to classify partial differential equations and change into canonical form. CO5: Students will be able to solve one- and two-dimensional Heat equation, Wave equation and Laplace equations.
Real Analysis (MATH-313)	CO1: They understand about basic idea of integration of functions. CO2: They will be able to understand application of Mean value theorems. CO3: students will be able to analyze convergence and divergence of improper integrals through different tests. CO4: Students will apply this knowledge in boundedness, finite intersection property, compactness, connectedness, components, continuity in relation with continuity in relation connectedness in Metric Space.
Inorganic Chemistry-IV (CHEM-311)	CO1: To learn importance of coordination compounds, classical ligands, non-classical ligands and multidentate ligands.  CO2: To understand the concept of isomerism in coordination compounds, nomenclature and stability of coordination compounds.  CO3: To learn about the valence bond theory for bonding in coordination compounds, concept of multiple bonding, strength and weaknesses of valence bond approach.  CO4: To understanding the splitting of d-orbitals in different fields for example octahedral and tetrahedral complexes.  CO5: To understanding the concept of thermodynamic effects of crystal field splitting and enthalpies of hydration of $M^{2+}$ ions.
Organic Chemistry-IV (CHEM-313)	CO 1: Learn the synthesis and chemical reactions of nitrogen and organosulphur compounds. CO 2: Develop the understanding of five and six membered heterocyclic compounds along with condensed five and six membered heterocyclics. CO 3: Recognize the importance and chemistry of saccharides, disaccharides and polysaccharides. CO 4: Understand the difference between fats and oil, soaps and detergents and get acquainted with the synthesis of synthetic dyes. CO 5: To know the chemistry related to amino acids, peptides, proteins and nucleic acids. CO 6: Practice to perform single and multi-step organic reactions.
Group and Rings (MATH-311)	CO1: Students will be able to understand different type of theorems in algebra.

	<p>CO2: students will be able to apply Group, Ring and Field theory in practical applications.</p> <p>CO3: They apply the knowledge of Groups and Rings in coding theory, quantum mechanics and many other fields.</p> <p>CO4: They understand about Unique Factorization Domain, Euclidean Domain and Principle Ideal Domain.</p>
<b>B.Sc. Sixth Semester</b>	
Atomic and Molecular Physics (PHY-322)	<p>CO1: Describe the Series in hydrogen, circular motion, nuclear mass effect, elliptical orbits, and energy levels. Fine structure, Sommer field and lamb shift.</p> <p>CO2: Explain General features, doublet structure, Larmor's theorem and magnetic levels, elementary theory of weak and strong magnetic fields, Zeeman Effect</p> <p>CO3: Systems with several electrons and spin functions. Complex Spectra: LS-Coupling scheme, normal triplets, selection rules and j-j coupling</p> <p>CO4: Explain rigid rotator, energy levels, Raman effect, Quantum theory of Raman effect.</p> <p>CO5: Describe the Non-rigid rotator: energy levels, spectrum, Vibrating-rotator energy levels, Infrared and Raman spectrum (no derivation of Dunham coefficients).</p> <p>CO6: Describes the Electronic Spectra: Electronic energy and potential curves, resolution of total energy, vibrational Structure of Electronic transitions. General formulae, Deslandre's table, absorption sequences (qualitative) and Vibrational analysis, Rotational Structure of Electronic bands</p> <p>CO7: Classification of electronic states: Orbital angular momentum, Spin, total angular momentum of electrons, Symmetry properties of electronic Eigen-functions.</p>
Particle Physics (PHY-324)	<p>CO1: Describe the energy loss of electrons and positrons, positron annihilation in condensed media, stopping power and range of heavier charged particles, Bethe-Bloch formula, interaction of gamma rays with matter.</p> <p>CO2: Explain and discuss nuclear detectors and counters.</p> <p>CO3: Describe accelerators: linear accelerators, cyclic accelerators, ion sources, focussing, stability, electron synchrotron, colliding beam machines, particle beams for fixed target experiments, CERN Super Proton Synchrotron (SPS) and Fermi lab Tevatron.</p> <p>CO4: Describe elementary particles and types of interactions, quantum numbers and conservation laws, isospin, charge conjugation, Yukawa theory, Introduction to quarks and qualitative discussion of the quark model, high energy physics units.</p> <p>CO5: Explain particle properties and their reactions,</p> <p>CO6: Discuss observations of different strange particles, strange particle</p>
Physics Laboratory – VI (PHY-326)	<p>CO1: Explain the characteristics of LED, photodiodes, silicon and GaAs solar cells.</p> <p>CO2: Explain the concept of a stable multi-vibrator, working of LASER.</p>

	<p>CO3: Understanding of Michelson interferometer and its applications.</p> <p>CO4: Describe the mechanism behind the production of electronic charge by Millikan oil drop method.</p> <p>CO5: Classify the heat capacity of different given materials.</p>
Dynamics (MATH-321)	<p>CO1: Basic terminologies of Dynamics</p> <p>CO2: Understand General motion of a rigid body, and apply in practical problems</p> <p>CO3: Able ability to apply knowledge of Dynamics in science and engineering</p> <p>CO4: Be proficient in the use of mathematical methods to analyze the forces and motion a system.</p> <p>CO5: Be able to identify, formulate, and solve science and engineering problems.</p>
Programming in C & Numerical Methods (MATH-324)	<p>CO1: Student will understand about the basic concept of C language.</p> <p>CO2: They will apply C language in solution of different practical problems.</p> <p>CO3: Students will be able to solve problems through programming in C and also handling functions</p> <p>CO4: They will solve linear and nonlinear problems using C language.</p> <p>CO5: They will be able to solve Integration, and solution of ordinary differential</p>
Physical Chemistry-V (CHEM-322)	<p>CO1: To learn importance of quantum mechanics, failure of classical concepts and some important basic principles of quantum mechanics.</p> <p>CO2: To understand the behaviour of particle in one and three dimensional box with translational energy, energy levels, quantization of energy and applications of particle in a box model.</p> <p>CO3: To learn about angular momentum, approximate Methods, operators used in quantum mechanics.</p> <p>CO4: Developing understanding for Valence-bond and molecular orbital approaches, electronic structures and pi-electron approximation.</p>
Organic Chemistry-V (CHEM-323)	<p>CO1: To learn importance of acyclic molecules, conformation, steric stereoelectronic effects and enantiomeric relationships.</p> <p>CO2: To understand the concept of free radical, carbanion nucleophile substitution reaction mechanism and regioselectivity.</p> <p>CO3: To learn about the alkylation of aldehydes, Favorskii rearrangements and aldol condensations.</p> <p>CO4: To understanding the concept of photochemistry, Jablonskidiagram, inter-system crossing singlet and triplet states.</p> <p>CO5: To understanding the concept of concerted reactions, unimolecular rearrangement and elimination reactions.</p>

**Department of Botany**  
**Akal College of Basic Sciences**

**Learning Outcomes**  
**Master of Science in Botany**  
**(M Sc Botany)**



**ETERNAL UNIVERSITY**  
**Baru-Sahib, Sirmaur (H.P.)**



**Eternal University, Baru Sahib (HP)**  
**Master of Science (M Sc Botany)**

Semester	Course code	Course name	L	T	P	C
<b>I</b>	BOT-511	Bryology	2	0	1	3
	BOT-512	Pteridology	2	0	1	3
	BOT-513	Gymnosperms	2	0	1	3
	BOT-514	Plant Resource Utilization	2	0	1	3
	BOT-515	Angiosperms: Phylogeny & Embryology	2	0	1	3
	BOT-516	Phycology	2	0	1	3
	BT-501	Cell & Molecular Biology	3	0	1	4
		<b>Sub Total</b>	<b>15</b>	<b>0</b>	<b>7</b>	<b>22</b>

<b>II</b>	BOT-521	Plant Anatomy	2	0	1	3
	BOT-522	Taxonomy of Angiosperms	2	0	1	3
	BOT-523	Cytogenetics & Plant Breeding	2	0	1	3
	BOT-524	Environmental Botany	2	0	1	3
	BOT-525	Mycology	2	0	1	3
	BOT-591	Synopsis Seminar	1	0	0	1
	BIOCHEM-522	Biochemistry and Molecular Biology of Plants	3	0	1	4
	BT-507	Plant & Animal Biotechnology	3	0	1	4
		<b>Sub Total</b>	<b>17</b>	<b>0</b>	<b>7</b>	<b>24</b>

<b>III</b>	BOT-531	Forestry	2	0	1	3
	BOT-532	Comprehensive Test & Field Botany	2	0	1	3
	BOT-533	Plant Pathology	2	0	1	3
	BOT-534	Plant Physiology	2	0	1	3
	BOT-591	Seminar	1	0	0	1
	BOT-599	Research Methodology	3	0	0	3
	BT-505	Computational Biology & Biostatistics	3	0	0	3
	BT-513	Genetic Engineering	3	0	0	3
		<b>Sub Total</b>	<b>18</b>	<b>0</b>	<b>4</b>	<b>22</b>

<b>IV</b>	BOT-600	Dissertation	0	0	20	20
		<b>Sub Total</b>	<b>0</b>	<b>0</b>	<b>18</b>	<b>20</b>
<b>Grand Total of All Semesters (I + II + III + IV)</b>			<b>50</b>	<b>0</b>	<b>38</b>	<b>88</b>

**Master of Science (Two-year degree programme)**  
**PROGRAMME OUTCOMES (POs)**

- PO1:** Qualified degree holders with broad background in the biology of plants.
- PO2:** Practically skilled and theoretical sound, educated botanists in the mission of Nation - building process with knowledge of plant molecules to the organism level - by covering a wide range of scientific disciplines concerned with the study of plants.
- PO3:** Help in meeting the manpower requirements of institutions of lower as well as higher learning and research centres by providing qualified professional plant biologists.
- PO4:** Influential contributions to scientific discovery and engage in formal and informal teaching and mentoring, and progress to careers in academia, industry, government and non-governmental organizations.
- PO5:** Qualified professional Botanists: Plant Taxonomists, Phyto-Physiologists, Phyto-Geneticist, Ecologist, and many more in the field of teaching and scientific research.

**PROGRAMME SPECIFIC OUTCOMES (PSOs): M Sc – Botany**

- PSO1: Scientific knowledge and understanding of:** Wide range of scientific disciplines concerned with the study of plants, which includes Bryology, Pteridology, Gymnosperms, Plant Resource Utilization, Angiosperms: Phylogeny & Embryology, Phycology, Cell & Molecular Biology, Plant Anatomy, Taxonomy of Angiosperms, Cytogenetics & Plant Breeding, Environmental Botany, Mycology, Biochemistry and Molecular Biology of Plants, Plant & Animal Biotechnology, Forestry, Comprehensive Test & Field Botany, Plant Pathology, Plant Physiology, Research Methodology, Computational Biology & Biostatistics, Genetic Engineering.
- PSO2: Practical skills:** To write and conduct independent research under mentorship; To identify the diverse group of plants and their pathogens from the environment; To perform and present self before the challenging teaching and research problems; To carry out practical work, in the field and in the laboratory, with precaution and minimal risk; To conduct vegetation and biochemical analyses of plants; Knowledge of appropriate statistical methods and computer basics.
- PSO3: Intellectual skills:** To generate logical thinking to solve the problem in effective and practical manner; To assimilate knowledge and ideas to plan and conduct an independent project; To construct and test the hypothesis to execute the real problems of plant sciences.
- PSO4: Use of modern scientific instruments & tools:** Understanding of principle, procedure, methodology, application of instrumentation, their precaution and limitations. Use of modern instruments and equipment for Biochemical analysis & estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants.

**PSO5: Moral principles & ethics:** To be morally responsible and ethical-conduct towards sustainability of biodiversity, environment and conservation.

### **COURSE OUTCOMES (COs)**

**Subject: Bryology**

**Subject Code: BOT – 511**

**CO1:** Understand the concepts and salient features of different taxonomic categories of bryophyta.

**CO2:** Demonstrate the structure and function of Antheridia and Archegonia in major taxonomic groups of bryophytes.

**CO3:** Understand the concepts related to evolution of sporophyte in bryophytes, conduction and water relations.

**CO4:** Demonstrate the epiphytes, epiphylls; epiliths litter species fire mosses, coprophilous species, calcicoles and calcifuges, halophytes, epizoic bryophytes.

**CO5:** Understanding the concept of dispersal of bryophyte diaspores, major patterns of bryophyte distribution.

**Subject: Pteridology**

**Subject Code: BOT – 512**

**CO1:** Understand the concepts and salient features of different taxonomic categories of Pteridophyta.

**CO2:** Demonstrate the structure and function of comparative morphology of the sporophyte, stelar system, sporangial characteristics.

**CO3:** Understand the spore structure, types and patterns of spore germination in ferns.

**CO4:** Demonstrate the natural and induced apogamy and apospory in pteridophytes.

**CO5:** Understanding the utility concept of ferns for phytoremediation, ferns as hyper accumulators of arsenic, mechanism of uptake, transfer and tolerance.

**Subject: Gymnosperms**

**Subject Code: BOT – 513**

**CO1:** Understand the concepts and salient features of different taxonomic categories of gymnosperms.

**CO2:** Demonstrate the distribution of gymnosperms with special reference to Indian members.

**CO3:** Understand the concepts of gymnosperms characteristics and their affinities with pteridophytes and angiosperms.

**CO4:** Demonstrate the vegetative morphology and reproductive organs of gymnosperms of Indian representatives.

**CO5:** Understanding the concept of comparative of analysis of various gymnosperm taxa on the basis of their distribution, morphology and reproductive structures.

**Subject: Plant Resource and Utilization**

**Subject Code: BOT – 514**

**CO1:** Demonstrate the center of origin and uses of minor cereals, oil crops and legumes.

**CO2:** Understand the concepts related to psychoactive drugs and narcotics: source, botany, active principle and commercial significance.

**CO3:** Demonstrate the concepts related to medicinal plants and their classification with reference to obtained drugs.

**CO4:** Demonstrate the concepts related to aromatic plants and their classification with reference to obtained drugs.

**CO5:** Understanding the concept of uses of plant-based insecticides.

**Subject: Angiosperms: Phylogeny & Embryology**

**Subject Code: BOT – 515**

**CO1:** Understand the concepts related to evolution and origin of Angiosperms.

**CO2:** Demonstrate the origin of monocot and dicots with reference to their relationships in evolutionary trends.

**CO3:** Understand the concepts related to development of male and female gametophytes.

**CO4:** Demonstrate the polyembryony.

**CO5:** Understanding the concept related to the development of embryo and their regulation of gene activity during embryogenesis.

**CO6:** Understanding the concept of the applied embryogenesis in vitro, embryo rescue in inviable crosses; Clonal multiplication, preservation of germplasm.

**Subject: Phycology**

**Subject Code: BOT – 516**

**CO1:** Understand the concepts and salient features of different taxonomic categories of algae.

**CO2:** Demonstrate the structure and function of thallus organization in algae.

**CO3:** Understand the current concepts and relationships of prochlorophycean algae.

**CO4:** Demonstrate the rhythms and bioluminescence in dinoflagellates.

**CO5:** Understanding the economic importance of algae.

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**Subject: Cell & Molecular Biology**

**Subject Code: BT – 501**

**CO1:** Understand the concepts related to evolution of cell and biological macromolecules.

**CO2:** Demonstrate the structure and function of plasma membrane, molecular organization of cytoskeleton.

**CO3:** Understand the concepts related to chromosome organization, chromatin structure, complexity of eukaryotic chromosome.

**CO4:** Demonstrate the DNA replication in prokaryote and eukaryotes.

**CO5:** Understanding the concept transcription process in prokaryote and eukaryotes.

**CO6:** Understanding the concept of Cell division and cell cycle, cell-cell interaction, cell differentiation.

**CO7:** Evaluate concept of translation process, genetic code, and apoptosis.

**Subject: Plant Anatomy**

**Subject Code: BOT – 521**

**CO1:** To acquaint the students with Structure and activity of vascular and cork cambia.

**CO2:** Demonstrate the xylem: constituents, differentiation of tracheary elements.

**CO3:** Understand the concepts of phloem: constituents, differentiation of sieve elements and companion cells.

**CO4:** Understanding the concept related leaf and its variation in structure, and Kranz anatomy.



**CO5:** Understanding the concept of seed coat anatomy with reference to legumes and cereals.  
**CO6:** Understanding the concept related anatomy in relation to taxonomy, phylogeny and ecology

**Subject: Taxonomy of Angiosperms**

**Subject Code: BOT – 522**

**CO1:** To acquaint the students with significance, aims and procedures of plant taxonomy; Alpha- and Omega- taxonomy; Biosystematics.  
**CO2:** Demonstrate the herbaria practices, and Botanical gardens.  
**CO3:** Understand the concepts of diagnostic keys, ranks of taxa and nomenclature of taxa according to their ranks.  
**CO4:** Understanding the plant nomenclature and the International Code of Botanical Nomenclature (ICBN).  
**CO5:** Understanding the concept of numerical taxonomy.  
**CO6:** Understanding the Botanical Survey of India, its organization and role.

**Subject: Cytogenetics & Plant Breeding**

**Subject Code: BOT – 523**

**CO1:** To acquaint the students with genomes organization in prokaryotes and eukaryotes.  
**CO2:** Demonstrate the organization of plastid and mitochondrial genomes.  
**CO3:** Understand the concepts of chromosome structure and DNA packaging, euchromatin and heterochromatin, karyotype analysis and banding patterns.  
**CO4:** Understanding the enzymes involved in replication, polymerase, topoisomerase, methylase, nucleases and restriction endonucleases.  
**CO5:** Understanding the concept of genetic recombination, and sex determination.  
**CO6:** Understanding the concept of principles of plant breeding.

**Subject: Environmental Botany**

**Subject Code: BOT – 524**

**CO1:** To acquaint the students to components and problems of environment, status of environment, its impact especially on plants.  
**CO2:** Demonstrate the management and conservation of natural resources.  
**CO3:** Understand the concept, level, measuring of biodiversity, significance in terms of economic, spiritual, scientific, educational, ecological and genetic values, the reasons for depletion, magnitude, distribution and conservation strategies.  
**CO4:** Understanding the concept of ozone depletion.  
**CO5:** Understanding the concept of weed ecology & management.  
**CO6:** Understanding the concept related to allelopathy, and allelochemicals.

**Subject: Mycology**

**Subject Code: BOT – 525**

**CO1:** To acquaint the students with introduction to fungi and their significance to humans.  
**CO2:** Demonstrate the characteristics of fungi and fungal systematic.  
**CO3:** Understand the general account, structure and reproduction of Chytridiomycota, Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota and mitotic fungi.  
**CO4:** Understanding the concept related to rust and smut fungi.

**CO5:** Understanding the detailed account of the different orders with specific reference to *Saprolegnia*, *Achlya*, *Legninidium*, *Pythium*, *Phytophthora* and *Albugo*.

**Subject: Synopsis Seminar**

**Subject Code: BOT – 591**

**CO1:** To acquaint the students with natural flora and fauna in various regions through field trips.

**CO2:** To organizing botanical excursions and visits to various herbaria and botanical gardens of the country.

**CO3:** Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

**CO4:** Demonstrate the applicability of field report on the basis of their excursion tours.

**CO5:** Understanding the concept of field botany and their application in comprehensive test based on it.

**Subject: Biochemistry & Molecular Biology of Plants      Subject Code: BIOCHEM–522**

**CO1:** To acquaint the students with structure and function of cell organelle.

**CO2:** Demonstrate the synthesis and transport of sucrose.

**CO3:** Understand the concepts of biochemistry of seed germination and development, biochemistry of fruit ripening, phytohormons and their mode of action, signal transduction.

**CO4:** Understanding the concept of nitrogen fixation and nitrate assimilation, sulphate reduction and incorporation of sulphur into amino acids.

**CO5:** Understanding the concept of biochemistry and significance of secondary metabolites.

**CO6:** Understanding the concept of molecular biology of various stresses.

**Subject: Plant & Animal Biotechnology**

**Subject Code: BT – 507**

**CO1:** To acquaint the students with laboratory organization and tissue culture.

**CO2:** Demonstrate the protoplast isolation, culture and applications.

**CO3:** Understand the somaclonal variation, production of haploid plants, embryo rescue and wide hybridization, cell suspension culture, production of secondary metabolites, biotransformation, and cryopreservation.

**CO4:** Understanding the concept of vectorless and vector mediated transformation.

**CO5:** Understanding the concept of different types of culture media and cell cultures.

**CO6:** Understanding the concept related to In vitro fertilization, embryo transfer technology and animal cloning.

**Subject: Forestry**

**Subject Code: BOT – 531**

**CO1:** To acquaint the students with silviculture.

**CO2:** Demonstrate the protection, causes and control of forest fires; Major diseases of forest plants.

**CO3:** Understand the concepts of forests types, climate of India, different climatic regions of India and central characters and distribution of the different forest types of India.

**CO4:** Understanding the concept of forest effects and economic value.

**CO5:** Understanding the concept of social and urban forestry.

**CO6:** Understanding the concept related to agroforestry.

**Subject: Comprehensive Test & Field Botany**

**Subject Code: BOT – 532**

**CO1:** To acquaint the students with natural flora and fauna in various regions through field trips.

**CO2:** To organizing botanical excursions and visits to various herbaria and botanical gardens of the country.

**CO3:** Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

**CO4:** Demonstrate the applicability of field report on the basis of their excursion tours.

**CO5:** Understanding the concept of field botany and their application in comprehensive test based on it.

**Subject: Plant Pathology**

**Subject Code: BOT – 533**

**CO1:** To acquaint the students with history of plant pathology and pathogenesis.

**CO2:** Demonstrate the enzymes and toxins in plant diseases.

**CO3:** Understand the concepts of host parasite interaction, alteration in plant physiological functions and defense mechanisms in plants.

**CO4:** Understanding the concept of resistance and susceptibility, vertical and horizontal resistance, mutation, heterokaryosis, transformation, transduction and physiological specialization.

**CO5:** Understanding the concept of plant pathogens dispersal and diseases forecasting.

**CO6:** Understanding the concept related to cultural and chemical control, breeding for disease resistance.

**Subject: Plant Physiology**

**Subject Code: BOT – 534**

**CO1:** To acquaint the students with recent concepts of structure and composition of membrane with various classes of pumps and their significance.

**CO2:** Demonstrate the plant respiration.

**CO3:** Understand the concepts of photosynthesis.

**CO4:** Understanding the concept related to nitrogen fixation by free and symbiotic organisms.

**CO5:** Understanding the concept of plant hormones.

**CO6:** Understanding the concept related to reproductive physiology, phytochrome/hormones in reproduction, stress physiology, secondary metabolites.

**Subject: Seminar**

**Subject Code: BOT – 591**

**CO1:** To acquaint the students with natural flora and fauna in various regions through field trips.

**CO2:** To organizing botanical excursions and visits to various herbaria and botanical gardens of the country.

**CO3:** Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

**CO4:** Demonstrate the applicability of field report on the basis of their excursion tours.

**CO5:** Understanding the concept of field botany and their application in comprehensive test based on it.

**Subject: Research Methodology**

**Subject Code: BOT – 599**

**CO1:** Understanding the concept of research, research applications in functional areas of business and emerging trends in Botany research.

**CO2:** Elaborate the scientific method of research, formulation of research projects, steps in research process and preparation of synopsis.

**CO3:** Understanding the qualities of a good hypothesis and concept of hypothesis testing and test of significance.

**CO4:** Understanding MS word, MS excel, and MS PowerPoint, graph and figure plotting.

**CO5:** Elaborate the concept & need of sampling and types of sampling.

**CO6:** Understanding scaling techniques and types of data.

**CO7:** Understanding the data analysis, graphical representation of data and writing of manuscripts.

**Subject: Computational Biology & Biostatistics**

**Subject Code: BT – 505**

**CO1:** To acquaint the students with definition of biostatistics, concept of variables in biological systems, collection, classification, tabulation, graphical and diagrammatic representation of numerical data, measure of central tendency, measure of dispersion, correlation and regression, linear and quadratic regressions, concept of standard errors.

**CO2:** Demonstrate the Test of significance based on Z,  $\chi^2$ , t and F statistics, correlation and regression, curve fitting by least squares methods.

**CO3:** Understand the concepts of protein and gene information resources.

**CO4:** Understanding the concept of global and multiple sequence alignment, multiple sequence alignment using FASTA, Sequence alignment using CLUSTAL W, BLAST and PSI BLAST.

**CO5:** Understanding the concept of gene finding algorithms and software's.

**CO6:** Understanding the concept related to protein-Protein interactions, proteomics, protein microarrays chips and data analysis.

**Subject: Genetic Engineering**

**Subject Code: BT – 513**

**CO1:** To acquaint the students with scope and milestones in genetic engineering and different Cloning vectors.

**CO2:** Demonstrate the extraction, purification and analysis of mRNA from eukaryotic cells.

**CO3:** Understand the concepts of Construction and screening of genomics and cDNA libraries.

**CO4:** Understanding the concept related to polymerase chain reaction and its variants.

**CO5:** Understanding the concept of expression in heterologous systems, vector engineering and codon optimization, expression of cloned genes in *E. coli*, yeast, insect, plants and mammalian cells.

**CO6:** Understanding the concept related to Genetic manipulation of higher animals and plants.



**Subject: Dissertation**

**Subject Code: BOT – 600**

**CO1:** To acquaint the students with dissertation work.

**CO2:** Demonstrate the research topic assigned.

**CO3:** Understand the concepts of given research topic and analyze and solve the problem.

**CO4:** To submit thesis for evaluation of students and they required to collect, analyze the data and submit their dissertation.

## **Programme: M.Sc. (Chemistry)(Two-year degree programme)**

### **PROGRAMME OUTCOMES (POs)**

**PO 1:** Provide platform for the understanding of concepts, principles, theories and mechanisms related to chemistry.

**PO 2:** Identifying and analyzing complex problems using research-based knowledge including design of experiments, analysis and interpretation of data.

**PO 3:** Develop skills for chemical tools/software required for the investigation and interpretation of data.

**PO 4:** Create awareness about the impact of chemical processes on society and environment along with the need for sustainable development.

**PO 5:** Motivation and support for research with special focus on interdisciplinary research.

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** To clearly understand the concepts and applications in the field of Chemistry, environment alongwith computer applications.

**PSO 2:** Students will be able to grasp the technological advancements in the usage of chemistry to analyse and design techniques/methods for variety of applications.

**PSO 3:** Enable students for placement opportunities and to pursue career in an interdisciplinary areas in India as well as abroad.

**PSO 4:** Students will be able to develop and demonstrate knowledge of statistical tools used in chemistry.

**PSO 5:** Learners can also acquire practical skills to work as chemist, faculty and other industrial supporting services.

M.Sc. Chemistry First Semester	
Course	Course Outcomes (COs)
<b>Basic Analytical Chemistry (CHEM-511)</b>	<p><b>CO 1:</b> Describe and compare a range of analytical chemistry methods and explain the underlying theoretical principles;</p> <p><b>CO 2:</b> Explain the broad role of analysts in quality control and assessment of experimental measurements from various application contexts;</p> <p><b>CO 3:</b> Employ a variety of analytical methods to prepare, separate and characterise samples from various matrices;</p> <p><b>CO 4:</b> As part of a team or individually, conduct, analyse and interpret results of a chemical analysis and effectively communicate these in written reports and other formats;</p> <p><b>CO 5:</b> Work safely and competently in an analytical laboratory setting.</p>
<b>Organo Transition Metal Chemistry and Inorganic Polymers (CHEM-512)</b>	<p><b>CO1:</b> Understand the reaction pathways of substitution, oxidative addition, reductive elimination, insertion and elimination reactions.</p> <p><b>CO2:</b> To learn the importance of homogeneous and heterogeneous catalysts in industrially accepted reactions.</p> <p><b>CO3:</b> To know the role of transition metal catalysts in various oxidation reactions and phase transfer catalysis.</p> <p><b>CO4:</b> Acquire the knowledge for the synthesis, properties and applications of polyphosphazenes, polysiloxanes and polysilanes.</p>
<b>Quantum Chemistry (CHEM-514)</b>	<p><b>CO1:</b> To learn importance of quantum mechanics, failure of classical concepts and some important basic principles of quantum mechanics.</p> <p><b>CO2:</b> To understand the behaviour of particle in one and three dimensional box with translational energy, energy levels, quantization of energy and applications of particle in a box model.</p> <p><b>CO3:</b> To learn about angular momentum, approximate Methods, operators used in quantum mechanics.</p> <p><b>CO4:</b> Developing understanding for Valence-bond and molecular orbital approaches, electronic structures and pi-electron approximation.</p>

<p align="center"><b>Organic Chemistry(CHEM-517)</b></p>	<p><b>CO 1:</b> Understand the difference among aromatic, non-aromatic and anti-aromatic compounds along with basic mechanistic kinetic concepts.</p> <p><b>CO 2:</b> Develop the understanding regarding stability and reactivity of reaction intermediates accompanied by chemistry of elimination reactions.</p> <p><b>CO 3:</b> To learn the chemistry pertaining to aromatic nucleophilic and electrophilic substitutions.</p> <p><b>CO 4:</b> To know the basic concepts and mechanisms related to aliphatic nucleophilic substitutions.</p>
<p align="center"><b>Solid State Chemistry (CHEM-518)</b></p>	<p><b>CO1:</b> To learn importance of X-ray Diffraction for Crystal Structure</p> <p><b>CO2:</b> To understand bonding in crystals, Band theory and Imperfections in crystal structures.</p> <p><b>CO3:</b> To learn about Properties of crystals like thermal properties and optical properties.</p> <p><b>CO4:</b> Developing understanding for general principles, experimental procedures, kinetics of solid state reactions.</p>
<p align="center"><b>Fundamental and Applications of Computers in chemistry(CSE-544)</b></p>	<p><b>CO1:</b> Understanding general about computers and Computer programming with application in chemistry and solving problems using computer programs.</p> <p><b>CO2:</b> Learning basic structure and functioning of a computer, memory, architecture, I/O devices, etc. Familiarity with a computer.</p> <p><b>CO3:</b> Learning computer languages: Opening editing, Compiling a file and running a programme.</p> <p><b>CO4:</b> Enable students to be able to draw plots by using computer programming.</p>
<p align="center"><b>Computational Biology and Biostatistics(BT-505)</b></p>	<p><b>CO 1:</b> To learn the introduction and concepts related to biostatistics.</p> <p><b>CO 2:</b> To know the significance of tests based on Z, <math>\chi^2</math>, t and F statistics.</p>



	<p><b>CO 3:</b> To understand the basics and principles of biological and chemical databases.</p> <p><b>CO 4:</b> To understand the principles involved in global and multiple sequence alignment.</p> <p><b>CO 5:</b> To learn the gene finding algorithms and softwares for proteins.</p>
<b>Practical(CHEM-516)</b>	<p><b>CO 1:</b> To understand the techniques used for gravimetric estimations and apply them in experiments.</p> <p><b>CO2:</b> Experimental learning of two and three step organic reactions.</p> <p><b>CO3:</b> Adequate understanding and practice of physical parameters determination such as viscosity, surface tension, solubility and density.</p>
<b>M.Sc. Chemistry Second Semester</b>	
<b>Organic Spectroscopy(CHEM-526)</b>	<p><b>CO 1:</b> To learn the basic concepts and techniques involved in IR spectroscopy.</p> <p><b>CO2:</b> Understanding the importance of UV-Vis spectroscopy and its application in the study of organic compounds.</p> <p><b>CO 3:</b> To develop the understanding of <sup>1</sup>H and <sup>13</sup>C NMR along with its applications.</p> <p><b>CO 4:</b> To learn the principles and related mechanisms of mass spectroscopy.</p>
<b>Bioinorganic Chemistry(CHEM-522)</b>	<p><b>CO 1:</b> To understand and compare the fundamentals and principles of bio-inorganic chemistry related to elementary cell biology.</p> <p><b>CO 2:</b> To know the role of different vitamins in the living beings followed by the merits and demerits of metals in medicine.</p> <p><b>CO 3:</b> To comprehend the properties of metalloenzymes and mechanism of photosynthesis.</p> <p><b>CO 4:</b> To understand the principles, mechanisms and importance of nitrogen fixation, nitrogenase enzymes, Nitrite reductase, nitrate reductase, nitrogen cycle and sulphur cycle.</p>
	<b>CO 1 :</b> To understand the fundamentals of amino acids and nucleic acids.

<p><b>Bioorganic Chemistry(CHEM-523)</b></p>	<p><b>CO 2 :</b> To learn the various principles and mechanisms involved in metabolism and metabolic reactions.</p> <p><b>CO 3:</b> To know the importance and mechanism of fatty acids and lipids.</p> <p><b>CO 4:</b> To describe the preparation, properties and application of soaps and to explain the structure and importance of DNA and RNA ;</p> <p><b>CO 5:</b> To develop the understanding related to chemical and enzymatic hydrolysis of nucleic acids, waxes and soaps.</p>
<p><b>Disconnection Approach in Organic Synthesis(CHEM-527)</b></p>	<p><b>CO1:</b> To know the application of stereochemistry in organic synthesis.</p> <p><b>CO2:</b> To understand the use and application of disconnection approach for organic synthesis.</p> <p><b>CO3:</b> Learner will know the basic principles of green chemistry and application of non-conventional techniques in organic synthesis</p> <p><b>CO4:</b> To learn general synthesis of compounds with three or more heteroatoms in the ring</p>
<p><b>Practicals (CHEM-525)</b></p>	<p><b>CO 1:</b> To learn the measurements techniques involved in refractive index, conductometry, partition co-efficient and adsorption.</p> <p><b>CO 2:</b> Learn the methods for the preparation and estimation of colloidal solution and thermochemistry experiments.</p> <p><b>CO 3:</b> Experimental learning of multistep organic synthesis along with with spectroscopic problems.</p>
<p><b>Computational Chemistry Lab (CHEM-529)</b></p>	<p><b>CO 1:</b> To learn the working of basic software used in chemistry.</p> <p><b>CO 2:</b> To get equipped with MS-Word. Power point, excel and statistical plotting.</p> <p><b>CO 3:</b> Learn to use the internet facility in the best possible way for research.</p>

<b>Credit Seminar(CHEM-591)</b>	<b>CO1:</b> Learning how to pick a problem for their research project and provide latest facts and updated information by consulting latest editions of textbooks, reference books, monographs and peer-reviewed national & international research journals.
<b>M.Sc. Chemistry Third Semester</b>	
<b>Research Methodology(CHEM-599)</b>	<p><b>CO 1:</b> The students would learn about various research methods used in research.</p> <p><b>CO 2:</b> To know how to do survey of literature in specific field and how to write synopsis for research proposal.</p> <p><b>CO 3:</b> To understand research as career; current status and future prospects of a specific research field.</p> <p><b>CO 4:</b> To learn experimental designs, sampling designs, recording of observation, measurement and scaling techniques.</p>
<b>Main Group Chemistry and Inorganic photochemistry(CHEM-531)</b>	<p><b>CO 1:</b> Describe and compare a range of inorganic photochemistry and main group chemistry fundamentals and explain the underlying theoretical principles;</p> <p><b>CO 2 :</b>Explain the broad role of photochemistry in quality control and assessment of experimental measurements from various application contexts;</p> <p><b>CO3:</b> Employ a variety of analytical methods to prepare, separate and characterise samples from various matrices;</p> <p><b>CO 4:</b> As part of a team or individually, conduct, analyse and interpret results of a chemical analysis and effectively communicate these in written reports and other formats;</p> <p><b>CO 5:</b> Work safely and competently in an inorganic laboratory setting.</p>
<b>Natural Products(CHEM-537)</b>	<p><b>CO 1:</b> To learn the classification and methods for structure determination of terpenoids and carotenoids.</p> <p><b>CO 2:</b> To understand the basics, stereochemistry and structure determination of steroids</p> <p><b>CO 3:</b> To Develop the understanding regarding structure elucidation and classification of alkaloids.</p>

	<b>CO 4:</b> To study the synthesis of vitamins and antibiotics.
<b>(CHEM-533) Advanced Statistical Thermodynamics and Symmetry</b>	<p><b>CO 1:</b> To understand the basics and laws pertaining to ideal gases.</p> <p><b>CO 2:</b> To get familiarize with the statistical basis of thermodynamics.</p> <p><b>CO 3:</b> To develop the understanding of thermodynamic properties of molecules from partition function.</p> <p><b>CO 4:</b> To know the symmetry elements and symmetry operations involved in group theory.</p>
<b>Current Trends in Organic Synthesis(CHEM-535)</b>	<p><b>CO 1:</b> To understand the classification, concepts and chemistry of pericyclic reactions.</p> <p><b>CO 2:</b> Learn the basic principles of photochemistry along with the photochemistry of alkenes, aromatic and carbonyl compounds.</p> <p><b>CO 3:</b> To develop the understanding of the chemistry of Aziridines, Azetidines, Indoles and azoles.</p> <p><b>CO 4:</b> Get familiarize with the preparation and applications of some reagents and reactions with mechanistic details.</p>
<b>Practicals (CHEM-538)</b>	<p><b>CO 1:</b> To learn the skills for the separation and purification of organic compounds followed by the characterization.</p> <p><b>CO 2:</b> Experimental learning of some name reactions used in organic synthesis.</p>
<b>Dissertation (Lit. Search, Synopsis) (CHEM-600)</b>	<b>CO 1:</b> Learning how to pick a problem for their research project and to provide latest facts and updated information by consulting latest editions of textbooks, reference books, monographs and peer-reviewed national & international research journals.
<b>M.Sc. Chemistry Fourth Semester</b>	
<b>Dissertation (Experimental, writing) (CHEM-600*)</b>	<b>CO 1:</b> Students will learn how to work on a research topic assigned to him/her by their supervisor/mentor with a



	purpose to develop a collective approach to study, analyze and solve the problem.
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## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Program Outcomes</b>	<b>Program Outcome of M.Sc. Mathematics</b>
<b>P01.</b>	Knowledge of advanced methods of mathematics, including some from the research frontier of the field, and expert knowledge of a well-defined field of study, based on recent trends of research in mathematics
<b>P02.</b>	Analysing, Mathematical Modelling and logical arguments power will be developed with mathematical concepts.
<b>P03.</b>	Communicate mathematical ideas with clarity and coherence, both written and verbally.
<b>P04.</b>	Perform research in conjunction with others as well as individually.
<b>P05.</b>	Enhance the job prospect
<b>Program Specific Outcomes</b>	<b>PSOs of M.Sc. Mathematics Program</b>
<b>P01.</b>	After completing the program student will be able to write Dissertation/Project work in Mathematics
<b>P02.</b>	They will be able to write computer program for solve real world problems.

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Analysis - I (MATH-521)</b> CO 01: Understand thing of Uncountability of the reals. Metric spaces, compact and connected sets, separability, equivalent metrics. CO 02: Understanding of Subsequences. Cauchy sequences. Upper and lower limits of a sequence of real numbers. Series, absolute convergence and rearrangement of series. CO 03: Idea of Limits of functions (in metric spaces) and continuity. CO 04: Understanding the concept of Continuous functions on compact domains and on connected domains. CO 05: Knowledge about Discontinuities and monotonic functions on intervals. CO 06: Integration of vector-valued functions and rectifiable curves., Uniform convergence of sequences and series of functions, its relation to continuity, integrability and equicontinuity. CO 07: Application of Stone-Weierstrass theorem.
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>Complex Analysis (MATH-522)</b> CO 01: Effectively write mathematical solutions in a clear and concise manner. CO 02: Effectively locate and use the information needed to prove theorems and establish mathematical results. CO 03: Demonstrate the ability to integrate knowledge and ideas of complex differentiation and complex integration in a coherent and meaningful manner and use appropriate techniques for solving related problems and for establishing theoretical results. CO 04: Demonstrate ability to think critically by proving mathematical conjectures and establishing theorems from complex analysis. CO 05: In addition, students will be able to: Operate with complex numbers, use the complex derivatives function, use and operate analytic functions, demonstrate knowledge of integration in the complex plane,

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

	<p>CO 06: Students apply Cauchy's theorem and Cauchy integral formula in practical problem.</p> <p>CO 07: Manipulate and use power series, understand residues and their use in integration.</p> <p>CO 08: Demonstrate the understanding of conformal mappings.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Algebra (MATH-523)</b></p> <p>CO 01: Student will get the knowledge about the groups, permutation group.</p> <p>CO 02: Student will get the knowledge about Jordan Holder series, nilpotent group, simple group, solvable group.</p> <p>CO 03: Students will get the knowledge about the rings, integral domain, polynomial ring</p> <p>CO 04: Students will apply their knowledge in the area principal ideal domain, unique factorization domain.</p> <p>CO 05: Students will get the knowledge about the irreducible criteria about polynomial ring.</p> <p>CO 06: Students will get the knowledge about field, prime field, sun field, algebraic extension, finite field extension</p> <p>CO 07: Student will get the knowledge about normal extension, inseparable extension</p> <p>CO 08: Students will get the knowledge about the field module, submodule, linear operator, characteristic polynomial, minimal polynomial.</p>
<b>Credits</b>	LTP:3/1/0

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Numerical Methods (MATH-524)</b>  CO 01: They will be able to find roots of linear and nonlinear algebraic and transcendental equations using different numerical methods CO 02: They get knowledge about solution of a system of non-linear equations by fixed point method and Newton-Raphson methods. CO 03: Analyze the rate and order of Convergence of different numerical methods. CO 04: Application of differential equations in real life and solution of initial-value problem by single and multistep methods such as Taylor series, Euler's, Euler's modified, Picard, Runge-Kutta, Predictor-Corrector, Milne-Thomson. CO 05: Application of differential equations in Science and Technology. Solution of linear and non-linear boundary-value problems, Rayleigh-Ritz, Galerkin, Shooting methods, Solution of Characteristics value problems, CO 06: Application and solution of Laplace and Poisson equations in two variables by five point formula, Solution of Laplace equation in two variables by ADI method, Solution of mixed boundary value problem, CO 07: Solution of problems using Computer Algorithm for elliptic equation in three variables, Solution of parabolic partial differential equation in two variables by explicit and implicit methods. CO 08: Idea of solution of parabolic equation in three variables by different method such as ADE and ADI methods. CO 09: Knowledge about Solution of hyperbolic equation in two variables by explicit and implicit methods and algorithm for hyperbolic equation in three variables, CO 10: Idea about Stability of finite difference schemes for parabolic and hyperbolic equations
<b>Credits</b>	LTP:3/0/1
<b>Course Outcomes</b>	<b>Ordinary Differential Equations (MATH-525)</b>  CO 01: Understand the concepts of real function theory. CO 02: Study of existence and uniqueness theorem for higher-order equations,



## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

	<p>CO 03: Basic knowledge of Homogeneous Linear System and Nonhomogeneous Linear System.</p> <p>CO 04: Application of Sturm-Liouville Problems.</p> <p>CO 05: Knowledge about Orthogonality of Characteristic Functions and expansion of function in orthonormal form.</p> <p>CO 06: Analyze separation theorem, Sturm's fundamental theorem Modification due to Picone, Conditions for Oscillatory or non-oscillatory solution.</p> <p>CO 07: Study of First and Second comparison theorems.</p> <p>CO 08: Application to Sturm Liouville System, Phase Plane, Paths, and Critical Points. Critical Points and paths of Linear Systems.</p> <p>CO 09: Understand the Critical Points and Paths of Nonlinear Systems. Limit Cycles and Periodic Solutions.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Analysis - II (MATH-531)</b></p> <p>CO 01: Student will understand about linear transformation from one space to another space.</p> <p>CO 02: They will understand the inverse function theorem, implicit function theorem and also gain the basic idea of matrix space.</p> <p>CO 03: Student will analyze the measurable theory and apply in practical problems</p> <p>CO 04: They will understand the integration and differentiation of measurable functions.</p> <p>CO 05: Student will analyze the convergence and divergence in measure.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Programming In C (MATH-533)</b></p>

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

	<p>CO 01: Student will understand about basic concepts, algorithm and flow chart in C language.</p> <p>CO 02: They will apply different loops in practical problems.</p> <p>CO 03: They will apply arithmetic expression in different problems.</p> <p>CO 04: Student will understand about data type and functions.</p> <p>CO 05: They will apply logical expressions and control statements in practical problems</p> <p>CO 06: Student will apply bit level operation and application of pointer.</p>
<b>Credits</b>	LTP:3/0/1
<b>Course Outcomes</b>	<p><b>Curves and Surfaces (MATH - 535)</b></p> <p>CO 01: Students will be able to understand basic concept of curves in <math>R^2</math> and <math>R^3</math>.</p> <p>CO 02: They will apply arc length, reparametrization, Curvature, torsion and Serret-Frenet formula in real life problems.</p> <p>CO 03: They will understand about first and second fundamental theorems.</p> <p>CO 04: Student will understand about Geodesics curvature and Gauss's theorem</p> <p>CO 05: They will apply the knowledge to calculate area, volume integrals, and surface area.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Partial Differential Equations (MATH-551)</b></p> <p>CO 01: Understand the Classification of Second order Partial Differential Equations.</p> <p>CO 02: Conversion of PDE in Canonical forms: Canonical form for Hyperbolic equation, Canonical form for Parabolic equation, Canonical form for elliptic equation.</p> <p>CO 03: Analysis and Derivation of Laplace Equation, Derivation of Poisson equation.</p> <p>CO 04: Application of Boundary Value Problems. Some important mathematical tools. Properties of Harmonic Functions.</p> <p>CO 05: Students understand the Dirac Delta Function.</p>

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

	<p>CO 06: Application and solution of one dimensional, and two-dimensional Heat and Wave equation by variable separation method.</p> <p>CO 07: Application and Analysis of Initial Value Problem; D'Alemberts Solution. Vibrating String – Variables Separable solution, Forced Vibrations – Solution of Nonhomogenous Equation.</p> <p>CO 08: Study of Boundary and Initial Value problem for one and two-dimensional Wave equation in Cylindrical Coordinates and Spherical Polar Coordinates.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Mathematical Statistics (MATH-552)</b></p> <p>CO 01: Effectively express themselves in statistical terms either in written or oral form.</p> <p>CO 02: Demonstrate ability to integrate knowledge and idea in a coherent and meaningful manner by implementing the basic regression analysis theory in solving “real world” problems.</p> <p>CO 03: Locate and use information from the output of statistical software to draw conclusion.</p> <p>CO 04: Work effectively with others in class discussions or small group projects.</p> <p>CO 05: To understand the mathematical theory behind common methods of statistical inference, such as point estimation, confidence intervals, and hypothesis testing.</p> <p>CO 06: To apply statistical methods learned to help solve interesting and realistic problems across a variety of fields.</p> <p>CO 07: Introductory probability and Bayes' theorem</p> <p>CO 08: Discrete random variables and their probability distributions</p> <p>CO 09: Continuous random variables and their probability distributions</p> <p>CO 10: Multivariate random variables and their probability distributions</p> <p>CO 11: Sampling distributions and the central limit theorem Interval estimation;</p>
<b>Credits</b>	LTP:3/1/0

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Research Methodology (MATH -599)</b> CO 01: Student will understand about ethics of research. CO 02: They will understand how to collect data or literatures. CO 03: They will apply different statistical tools in their research work. CO 04: Student will understand about citation of work and plagiarism. CO 05: Student will understand about different experimental design such as CRD, RBD and Latin square design. CO 06: Student will apply their knowledge to write the synopsis, research paper and thesis.
<b>Credits</b>	LTP:3/0/0
<b>Course Outcomes</b>	<b>Discrete mathematics (MATH-533)</b> CO 01: Student will understand about basic concept of set theory and relations. CO 02: They will apply the knowledge in practical problems such as AND, OR, NOR gates etc. CO 03: Student will be able to understand about permutation, combination. CO 04: They will apply Pigeonhole principle in real life practical problems, CO 05: Student will understand about graph theory and apply this knowledge to solve practical problems. CO 06: They will understand about Boolean algebra and apply the circuit theory in solution of complicated problems. CO 07: They will get knowledge about trees and application in real life problems.
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>TOPOLOGY (MATH - 561)</b> CO 01: Student will understand about basic concept of set theory and metric space. CO 02: They will understand about Topological Spaces, examples and its application.

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

	<p>CO 03: Student will analyze different type space such as compact, connected, Hausdorff, and separated space</p> <p>CO 04: They will understand different type theorems such as Urysohn's lemma, Urysohn imbedding, Tietze's extension, and Stone-Cech compactification theorems etc.</p> <p>CO 05: They will understand about different shapes.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Functional Analysis (MATH-563)</b></p> <p>CO 01: Student will understand about Normed linear space and Banach space and its applications.</p> <p>CO 02: they will analyse Hahn-Banach, Banach-Steinhaus, Open Mapping and Closed Graph Theorems.</p> <p>CO 03: Student understand about dual spaces and reflexivity, weak and weak star convergence.</p> <p>CO 04: They will be able to understand different type operators such as adjoint operator, self-adjoint, normal and unitary operators on Banach and Hilbert spaces.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Number theory-I (MATH- 562)</b></p> <p>CO-01: Students will get the knowledge about divisibility, g.c.d. the fundamental theorem of arithmetic.</p> <p>CO-02: Students will gain the knowledge in the field Chinese remainder theorem, Fermat's theorem, and Wilson's theorem.</p> <p>CO-03: students will check their knowledge in the field residue class, Euler's theorem.</p> <p>CO-04-students will gain the knowledge in the field quadratics residue, Legendre symbol, jacobi symbol, Diophantine equation.</p>



## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Difference Equation (MATH-564)</b></p> <p>CO 01: Students will be able to apply Euler's summation formula and Bernoulli polynomials in practical problems.</p> <p>CO 02: Students understand about linear and non-linear difference equations and be able to solve.</p> <p>CO 03: Students will be able to analyze the stability of linear and Nonlinear system.</p> <p>CO 04: Students will understand Volterra summation equation and Fredholm summation equation.</p> <p>CO 05: Students apply Z-Transform as a mathematical tool for solving difference equation.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Coding Theory (MATH-565)</b></p> <p>CO 01: They understand about linear code and encoding and decoding techniques.</p> <p>CO 02: They will apply this technique to remove noisy data.</p> <p>CO 03: Students will be able to apply this technique in security analysis.</p> <p>CO 04: They understand about Hamming code, perfect code and Latin square</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Non-Commutative Rings (MATH-566)</b></p> <p>CO 01: Student will understand basic knowledge about rings, module and submodule theory.</p> <p>CO 02: Student will analyze direct sums and direct products of rings and modules and its application.</p> <p>CO 03: They will understand Injective modules and divisible modules</p> <p>CO 04: Student will apply the knowledge of module theory in coding and decoding theory and security system etc.</p>

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Calculus of Variations and Analytical Mechanics (MATH-567)</b></p> <p>CO 01: Students understand about Euler's equation and its application.</p> <p>CO 02: They apply Generalized coordinates, Holonomic and Non-Holonomic systems in physical problems.</p> <p>CO 03: Students understand about Lagrange's equations of first and second kind and Choice of Lagrangian.</p> <p>CO 04: Students will be able to apply Lagrange brackets and Poisson brackets under canonical transformations.</p>
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<p><b>Operations Research (MATH568)</b></p> <p>CO01: Understand the basic definitions and the properties of Hyperplane and hyperspheres, convex sets convex, concave functions and their properties.</p> <p>CO02: Formulate the problem in Mathematical form and solve the Linear programming problem using different existing method.</p> <p>CO03: Mathematically formulate and solve Transportation and Assignment problems.</p> <p>CO04: Formulate mathematical model in Goal Programming and be able to solve using existing method.</p> <p>CO05: Understand the concept of Duality and be able to solve by Dual simplex algorithm.</p> <p>CO06: Apply different existing method to solve integer programming problem.</p> <p>CO07: Apply Game theory to make decision in practical managerial problems.</p> <p>CO08: Able to find shortest path of Spanning tree.</p> <p>CO09: Able to solve Maximal flow problem.</p>

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Nonlinear Optimization (MATH571)</b> CO01: Understand convex hulls, Closure and interior of a set, Separation and support of sets, Separation theorems of convex sets, convex cones and polarity, polyhedral sets, Extreme points and extreme directions CO02: Knowledge of definitions and Basic properties of convex functions generalized convex functions, Differentiable convex functions, twice differentiable convex functions. CO03: Able to find Minima and Maxima of Convex functions. CO04: Apply Fritz John and Karush-Kuhn-Tucker optimality conditions for solving non linear programming problem. CO05: Able to solve Linear quadratic programs.
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>Number theory-II (MATH-572)</b> CO-01: Students will gain the knowledge in the field Farey sequence, continued fraction, pell's equation, Minkowski's inequality. CO-02: Students will check their knowledge in the field of the prime number theorem, Euler summation formula, and Abel's identity. CO-03: Students will get the knowledge about the practical problems related to Fermat's theorem, Wilson's theorem, Chinese remainder theorem.
<b>Course Outcomes</b>	<b>Non Commutative Rings(MATH-566):</b> CO 01: Students get knowledge about basic concepts of non commutative rings. CO 02: They understand about modules and submodules. CO 03: They understand about Artinian rings, Wedderburn-Artin theorem. CO 04: Students will understand basic concept of injective hulls.
<b>Credits</b>	LTP:3/1/0

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Commutative Algebra (MATH-573)</b> CO 01: They understand about prime, semi-prime, primary, maximal in ring theory CO 02: Student will analyze Chinese reminder theorem for solution algebraic equation and also in factorization of numbers. CO 03: They will understand about Chain conditions, maximal and minimal conditions in noetherin ring theory. CO 04: Student understand about applications to principal ideal domains and Artinian rings
<b>Course Outcomes</b>	<b>Algebraic Topology (Math-574)</b> CO 01: Student will understand about definition and some examples of homotopies and its applications. CO 02: They will analyze fundamental group of a space and the effect of a continuous mapping on fundamental group. CO 03: Student will understand about projection of space and torus, homomorphisms and automorphisms of covering spaces. CO 04: They will understand about Brower fixed-point theorem in two dimensions.
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>Fuzzy set theory and application (MATH575)</b> CO01: Understand basic definitions of fuzzy set and their properties CO02: They will know about Fuzzy numbers and relation between fuzzy number and a convex fuzzy set Operations on fuzzy numbers in terms of its membership functions as piecewise defined functions, fuzzy cardinality of a fuzzy set using fuzzy numbers, arithmetic operators on fuzzy numbers CO03: Able to solve fuzzy equations, equation $A+X = B$ , equation $A.X = B$ CO04: Know about Crisp and fuzzy relations

## Courses Offered by Department of Mathematics for Program Outcome of M.Sc. Mathematics

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<b>Stochastic Processes (MATH576)</b> CO01: Have a reinforced knowledge of basic probability theory and effectively express themselves in statistical terms either in written or oral. CO02: Understand and apply sequences of random variables CO03: Have a firm understanding of the central limit theorem and its applications CO04: Understand the basic concepts of continuous random processes CO05: Apply the knowledge of Poisson Process and Markov chains in practical situations CO06: Apply the concept of Random walk-in real-world problems
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>Applied Functional Analysis (MATH - 577)</b> CO 01: Student will understand about basic properties of Hilbert space and its applications. CO 02: They will analyze Minkowski functional, Separation Theorem and Kuhn-Tucker Theorems. CO 03: Student will be able to understand Spectral theory of operators and compact operations. CO 04: Student will understand $L^2$ spaces over Hilbert spaces and its properties.
<b>Course Outcomes</b>	<b>Fluid Mechanics (MATH- 578)</b> CO 01: Students will understand the basic concept of fluid mechanics. CO 02: They apply Euler's equation of motion, Bernoulli's equation in real situations. CO 03: They get idea about velocity potential and stream functions.



**Courses Offered by Department of Mathematics for Program Outcome of M.Sc.  
Mathematics**

**Program Outcomes, Program Specific Outcomes, Course Outcomes**

	CO 04: They understand about Milne Thomson Circle Theorem, and Blasius Theorem.
<b>Credits</b>	LTP:3/1/0
<b>Course Outcomes</b>	<b>Integral equation and transformation (MATH-554)</b> CO 01: Student will learn the classification of linear integral equation. CO 02: Student will be able to compute resolvent kernel. CO 03: Student will be able to solve the integral equation through different techniques.

**M.Sc. (Physics) Program**  
**Program Outcomes, Program Specific Outcomes, Course Outcomes**

Program Outcomes	M.Sc. (Physics) Program
PO1.	<b>Scientific knowledge:</b> Apply the knowledge of physics fundamentals with the help of mathematics to the solution of physical problems.
PO2.	<b>Problem analysis:</b> Identify, formulate, research literature, and analyze physical problems using basic principles of physics.
PO3.	<b>Conduct investigations of complex problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO4.	<b>Individual and team work:</b> function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO5.	<b>Communication:</b> Communicate effectively on complex activities with the scientific community and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO6.	<b>Modern tool usage:</b> Apply appropriate techniques, resources, and modern scientific & engineering techniques to complex physical activities with an understanding of the limitations.
PO7.	<b>Research Proficiency:</b> Apply various modern techniques for research specific activities/experiments and analysis purpose
PO8.	<b>Life-long learning:</b> Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.
Program Specific Outcomes	PSOs of M.Sc. (Physics) Program
PO1.	Understand the advanced concepts Mathematical Physics, Classical Mechanics, Statistical Mechanics, Quantum Mechanics, Electronics Nuclear & Particle Physics, Atomic and Molecular Physics, Quantum Field Theory, Classical Electrodynamics, Condensed Matter Physics, General Theory of Relativity, Material Science, Renewable Energy Sources, Nano Physics
PO2.	Perform procedures/experiments as per laboratory standards
PO3.	Understand the complex applications of physics in real world problems

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-511- Mathematical Physics I”</b></p> <p>Describe general understanding of various mathematical tools used for solving various Physical problems.</p> <p>CO1: Describe the vector algebra &amp; vector calculus and solve related problems.</p> <p>CO2: Explain delta, beta and gamma functions and solve related problems.</p> <p>CO3: Describe Integral transforms and solve related problems.</p> <p>CO4: Describe Fourier series and its properties and solve related problems.</p> <p>CO5: Explain matrices and solve related problems.</p> <p>CO6: Describes tensors and solve related problems.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-512- Classical Mechanics”</b></p> <p>Describe general understanding of Lagrangian and Hamiltonian Formulation, Canonical Transformations, Rigid Body Motion.</p> <p>CO1: Describe the Mechanics of a system of particles, constraints of motion, generalized coordinates.</p> <p>CO3: Describe Hamilton’s principle, Legendre Transformation</p> <p>CO2: Explain D’Alemberts Principle, applications of Lagrangian formulation.</p> <p>CO4: Describe Canonical Transformation and Hamilton–Jacobi Theory</p> <p>CO5: Explain orthogonal transformations, Euler’s theorem</p> <p>CO6: Describe inertia tensor, Small Oscillations</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-513- Condensed Matter Physics – I”</b></p> <p>Describe general understanding of lattice dynamics, thermal properties, energy band theory, transport theory and liquid crystals.</p> <p>CO1: Develop an understanding of elastic properties in solids.</p> <p>CO2: Explain thermal properties, lattice vibrations, normal modes.</p> <p>CO3: Enumerate and explain Electrons in a periodic potential, Bloch theorem, Semiconductor Crystals, superlattices.</p> <p>CO4: Define the transport theory, Boltzmann transport equation, Hall effect, Magnetoresistance.</p> <p>CO5: Develop an understanding of liquid crystals and physics of liquid crystal devices.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “<b>PHY-514- Quantum Mechanics</b>”</p> <p>Describe general understanding of Basic Quantum Mechanics and related physical problems.</p> <p>CO1: Develop an understanding of the mathematical tools and basic concepts of quantum mechanics.</p> <p>CO2: Develop an understanding of angular momentum and related problems.</p> <p>CO3: Understand stationary state approximation methods and their applications.</p> <p>CO4: Understand time dependent perturbation theory and its applications.</p> <p>CO5: Develop an understanding of various problems related to scattering theory</p>
Credits	03 Theory periods of one hour per week over a semester

Course Outcomes	<p>COs of the course “<b>ETE-515- Electronics-I</b>”</p> <p>Describe general understanding of Circuit Analysis, Semiconductor Devices and applications, Communication systems and related problems.</p> <p>CO1: Develop an understanding of circuit analysis such as Thevenin and Norton theorems, Mesh and Node analysis.</p> <p>CO2: Enumerate and explain the Direct and indirect semiconductors, diodes, Solar cell, UJT, Gunn diode, IMPATT devices, Liquid crystal displays, FET.</p> <p>CO3: Enumerate and explain the Differential amplifiers, Analogue computation, oscillator, filters</p> <p>CO4: Clearly define the communication systems in broad aspects such as review of analog modulation techniques, analog pulse modulation techniques, Pulse code modulation, satellite communication and cellular mobile communication.</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course <b>“PHY-516- Physics Laboratory-I”</b></p> <p>Describe general understanding physics practical and related problems.</p> <p>CO1: Understanding and determine the coefficient of self-inductance of a coil by Anderson bridge.</p> <p>CO2: Study of Cathode Ray Oscilloscope and its various applications.</p> <p>CO3: Study of characteristics of semi-conductor devices (UJT, FET).</p> <p>CO4: Study of tunnel diode and Zener diode characteristics.</p> <p>CO5: Designing and study of Op-Amp: Characteristics and parameter measurements.</p> <p>CO6: Study of multi vibrators (a) a stable (b) bi-stable (c) mono-stable.</p> <p>CO7: To study Op-Amp as an active filter, its frequency response and basic mathematical operations.</p> <p>CO8: Determination of thickness of mica sheet using Michelson Interferometer.</p> <p>CO9: To determine the velocity of ultrasonic waves in a given liquid.</p>
Credits	03 Theory periods of one hour per week over a semester

Course Outcomes	<p>COs of the course <b>“PHY-517- Computational Physics Laboratory-I”</b></p> <p>Describe general understanding of MATLAB and its application in mathematical and physical problems.</p> <p>CO1: Develop an understanding of basic commands used for programming in MATLAB.</p> <p>CO2: Develop an understanding of programming in MATLAB for various mathematical problems.</p> <p>CO3: Develop an understanding of programming in MATLAB for various physics problems.</p> <p>CO4: Enumerate and explain programming in MATLAB for various material science problems.</p>
Credits	03 Theory periods of one hour per week over a semester



## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-521–Mathematical Physics II”</p> <p>Describe general understanding of Group Theory, Tensors, Fourier Series and Integral Transforms, integral Equations and related physical problems.</p> <p>CO1: Develop an understanding of a group, Multiplication table, subgroups, Isomorphism and Homomorphism, Reducible and irreducible representations, special unitary groups SU(2) and SU(3).</p> <p>CO2: Enumerate and explain tensors, contraction, Levi–Civita symbol, Noncartesian tensors, metric tensor, covariant differentiation.</p> <p>CO3: Enumerate and explain the Fourier series, Fourier transforms, Fourier transforms of derivatives; Momentum representation. Laplace transforms, Laplace transforms of derivatives</p> <p>CO4: Clearly define the Integral Equations, integral transforms and generating functions. Hilbert–Schmidt theory, Green’s functions, Numerical Techniques</p>
Credits	03 Theory periods of one hour per week over a semester

Course Outcomes	<p>COs of the course “PHY-522– Condensed Matter Physics - II” Describe general understanding of optical properties and related theories, magnetism, principal of magnetic resonance, superconductivity and disordered materials and related problems.</p> <p>CO1: Develop an understanding of Macroscopic theory - generalized susceptibility, Kramers– Kronig relations, Brillouin scattering, Raman effect and interband transitions.</p> <p>CO2: Enumerate and explain Dia- and para-magnetism in materials, Ferro-, ferri- and antiferromagnetism, Pauli paramagnetism, Heisenberg Hamiltonian mean field theory; spin waves.</p> <p>CO3: Explain and understand ESR and NMR - equations of motion, line width, motional narrowing, and Knight shift.</p> <p>CO4: Develop a basic understanding about superconductors: BCS pairing mechanism and nature of BCS ground state; Flux quantization.</p> <p>CO5: Explain and understand the basic concepts of defects and dislocations; noncrystalline solids such as glasses, Quasi-crystals, amorphous semiconductors and ferromagnets.</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-523-Relativistic Quantum Mechanics &amp; Quantum Field Theory” Describe general understanding of Relativistic Klein- Gordon Equation, Relativistic Dirac Equation, Quantization of wave fields, Quantum Field Theory and related problems</p> <p>CO1: Develop an understanding of Klein-Gordon equation, interaction with electromagnetic fields</p> <p>CO2: Enumerate and explain Dirac Equation, Covariance of Dirac equation and bilinear covariance</p> <p>CO3: Enumerate and explain quantization of wave fields</p> <p>CO4: Clearly define the Covariant perturbation theory, Feynman diagrams and their applications, Wick’s Theorem. Scattering matrix.</p>
Credits	03 Theory periods of one hour per week over a semester

Course Outcomes	<p>COs of the course “PHY-524-Classical Electrodynamics” Describe general understanding of Electrostatics, Magnetostatics, Boundary value problems, Electromagnetic Waves and related problems</p> <p>CO1: Develop an understanding of Laplace and Poisson’s equations, Electrostatic potential, vector potential</p> <p>CO2: Enumerate and explain Dirichlet and Neumann Boundary conditions, Boundary value problems</p> <p>CO3: Enumerate and explain Time varying fields and Maxwell equations</p> <p>CO4: Define the wave equation, plane waves in free space and isotropic dielectrics</p> <p>CO5: Define Radiation from Localized Time varying sources &amp; Charged Particle Dynamics</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-525– Statistical Mechanics”</b></p> <p>Describe general understanding of Statistical Basis of Thermodynamics, Ensembles and related physical problems.</p> <p>CO1: Explain the Statistical Mechanics of physics.</p> <p>CO2: Explain the Quantum statistics.</p> <p>CO3: Explain the effect Phase Transition.</p> <p>CO4: Explain the concept of Thermodynamics fluctuation.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“ETE-526– Electronics II”</b></p> <p>Describe general understanding of Digital circuits, A/D Converters, Digital logic families, Microprocessor, Semiconductor Memories.</p> <p>CO1: Develop an understanding of Flip-Flops, A/D &amp; D/A Converters</p> <p>CO2: Enumerate and explain RTL, DTL, TTL, ECL, CMOS, CMOS</p> <p>CO3: Enumerate and explain Microprocessor 8085 Architecture, memory interfacing, Assembly language programming</p> <p>CO4: Define the ROM, PROM and EPROM, RAM, Static and Dynamic Random Access Memories</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-527- Physics Laboratory-II”</b></p> <p>General understanding of Physics lab experiments and physical problems.</p> <p>CO1: To study temperature-dependence of conductivity of a given semiconductor crystal using four probe method.</p> <p>CO2: To determine the band gap of a semiconductor by Four Probe Method.</p> <p>CO3: To study the temperature dependence of a ceramic capacitor: Verification of Curie-Weiss law for the electrical susceptibility of a ferroelectric material.</p> <p>CO4: To determine the Hall voltage, Hall coefficient and the carrier concentration of a given semi-conductor.</p> <p>CO5: To study the modulation &amp; demodulation of AM wave.</p> <p>CO6: To study the modulation&amp; demodulation of FM wave.</p> <p>CO7: To determine the dielectric constant of a liquid by dipole meter.</p>
<b>Credits</b>	03 Practical periods of two hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course <b>“PHY-528- Computational Physics Laboratory-II”</b></p> <p>Describe general understanding of MATLAB and its application in mathematical and physical problems..</p> <p>CO1: Develop an understanding of programming in MATLAB for various mathematical physics problems.</p> <p>CO2: Develop an understanding of programming in MATLAB for various quantum physics problems.</p> <p>CO3: Develop an understanding of programming in MATLAB for various nuclear physics problems.</p> <p>CO4: Develop an understanding of programming in MATLAB for various material science problems.</p>
Credits	02 Practical periods of two hour per week over a semester

Course Outcomes	<p>COs of the course <b>“PHY-531-Nuclear and Particle Physics”</b></p> <p>Describe general understanding of Nuclear Masses and Nucleon-Nucleon Interaction, Nuclear Structure, Nuclear Models, nuclear reactions, Classification of fundamental forces</p> <p>CO1: Develop an understanding of nuclear masses, nuclear mass formula, stability of nuclei, beta decay and double beta decay, deuteron problem, nuclear potential.</p> <p>CO2: Enumerate and explain Shell Model Potential and Magic Numbers</p> <p>CO3: Enumerate and explain the Nuclear Collective Vibrations, Nuclear Collective Rotation</p> <p>CO4: Clearly define the Types of nuclear reactions, cross-sections, Breit-Wigner formula</p> <p>CO5: Classification of Elementary particles and their quantum numbers, Gellmann-Nishijima formula. Quark model, Standard Model of Particle Physics</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-532-Atomic and Molecular Physics” Describe general understanding of many electron atoms and molecular quantum mechanics, various atomic and molecular spectroscopy, interactions of atoms with radiation</p> <p>CO1: Develop an understanding of spectrum of Hydrogen, Helium and alkali atom. quantum virial theorem Hartree and Hartree-Fock method, periodic table and atomic properties: ionization potential, electron affinity, Hund’s rule.</p> <p>CO2: Enumerate and explain Molecular Quantum Mechanics: Electron spin. Hydrogen molecular ion, hydrogen molecule, Relativistic corrections Hyperfine structure and isotope shift, width of spectrum lines, LS and JJ couplings.</p> <p>CO3: Develop an understanding of fine and hyperfine structure of atoms, electronic, vibrational and rotational spectra for diatomic molecules, role of symmetry, selection rules, term schemes, and applications to electronic and vibrational problems.</p> <p>CO4: Develop an understanding Zeeman, Paschen-Bach-Oppenheimer approximation. Electronic, rotational, vibrational and Raman spectra of diatomic molecules, selection rules.</p> <p>CO5: Explain and understand the basic concepts of atoms in an electromagnetic field, induced absorption and emission, spontaneous emission and line-width, Einstein A and B coefficients, density matrix formalism, two-level atoms in a radiation field, Lasers.</p>
Credits	03 Theory periods of one hour per week over a semester



## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-533– Material Science” Describe general understanding of various type of materials, structural properties of materials, materials preparation and characterization techniques and related topics.</p> <p>CO1: Develop an understanding of material noncrystalline and semi crystalline states, crystal systems, indices of lattice directions and planes, symmetry classes and point groups, space groups, phase transition in materials etc.</p> <p>CO2: Enumerate and explain Crystalline &amp; amorphous materials, high <math>T_c</math> superconductors, alloys &amp; composites, semiconductors, solar energy materials, luminescent and optoelectronic materials, Polymer, Liquid crystals and quasi crystals, Ceramics.</p> <p>CO3: Develop an understanding of preparation of materials by different techniques (e.g. zone refining, epitaxial growth. Melt-spinning and quenching methods, sol-gel), Top down and bottom up approaches of synthesis of nano-structured materials. Fullereness and tubules, Single wall and multiwall nanotubes.</p> <p>CO4: Develop an understanding of various Materials Characterization Techniques (e.g. XPS, STM, AFM, TEM, SEM, IR, Ultraviolet (UV) and visible spectroscopy)</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-534(I)-Opto-Electronics” Describe general understanding of Injection luminescence, the basic principles of laser actions, optical detectors, junction detectors and related problems.</p> <p>CO1: Develop an understanding of recombination processes, the spectrum of recombination radiations, direct and indirect band gap semiconductors, internal quantum efficiency, and external quantum efficiency.</p> <p>CO2: Enumerate and explain spontaneous and stimulated emission and absorption, the condition for the laser action, theory of Laser action in semiconductors, condition for gain, Semiconductor Injection Laser: efficiency, stripe geometry LED materials.</p> <p>CO3: Explain and understand optical detection, quantum efficiency, responsivity, photoconductive detectors, characteristics of particular photoconductive materials, solar cell, holography, liquid crystal displays, optical fibers, free space optics and their applications</p> <p>CO4: Develop an understanding of detectors performance parameters, semiconductors p-i-n diodes, materials and design for p-i-n photodiodes. Avalanche photodiodes detectors (APD), Avalanche photodiodes design, phototransistors.</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-534(II)-Nonlinear Dynamics” Describe general understanding of phenomenology of chaos, dynamics in state space, hamiltonian system, quantifying chaos, quantum chaos and related problems.</p> <p>CO1: Develop an understanding of linear and nonlinear systems, A nonlinear electrical system, biological population growth model, lorenz model; unpredictability and divergence of trajectories, feigenbaum numbers and size scaling, models and universality of chaos.</p> <p>CO2: Enumerate and explain state space, autonomous and non-autonomous systems, dissipative systems, one dimensional state space, linearization near fixed points, two dimensional state spaces, dissipation and divergence theorem, bifurcation theory, Heuristics, three-dimensional dynamical systems etc.</p> <p>CO3: Explain and understand non-integrable systems, KAM theorem and period doubling, standard map, applications of Hamiltonian dynamics, chaos and stochasticity.</p> <p>CO4: Develop an understanding of time series, lyapunov exponents. Invariant measure, kolmogorov-Sinai entropy. Fractal dimension, Statistical mechanics and thermodynamic formalism.</p> <p>CO5: Explain and understand quantum mechanical analogies of chaotic behaviour, distribution of energy eigenvalue spacing, chaos and semi-classical approach to quantum mechanics.</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-534(III)-Particle Accelerator Physics” Describe general understanding of charged particle dynamics, radiofrequency accelerators, electrostatic and heavy ion accelerators, synchrotron radiation sources, radioactive ion beams and related problems.</p> <p>CO1: Develop an understanding of linear and nonlinear systems, A nonlinear electrical system, biological population growth model, lorenz model; determinism, unpredictability and divergence of trajectories etc.</p> <p>CO2: Enumerate and explain state space, autonomous and non-autonomous systems, dissipative systems, one dimensional state space, linearization near fixed points, two dimensional state spaces, dissipation and divergence theorem, Three-dimensional dynamical systems etc.</p> <p>CO3: Explain and understand non-integrable systems, KAM theorem and period doubling, standard map. applications of Hamiltonian dynamics, chaos and stochasticity.</p> <p>CO4: Develop an understanding of time series, lyapunov exponents. Invariant measure, kolmogorov -Sinai entropy. Fractal dimension, Statistical mechanics and thermodynamic formalism.</p> <p>CO5: Explain and understand quantum mechanical analogies of chaotic behaviour, distribution of energy eigenvalue spacing, chaos and semi-classical approach to quantum mechanics.</p>
Credits	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Course Outcomes	<p>COs of the course “PHY-534(IV)–Astrophysics” Describe basic concepts of celestial sphere, interstellar medium and molecular clouds, stellar evolution and nucleosynthesis, cosmology and related topics.</p> <p>CO1: Develop an understanding of right ascension, ecliptic, basic stellar properties; luminosity, estimation of distance using parallax method and cepheid variables, origin of emission and absorption spectra, Doppler effect and its applications etc.</p> <p>CO2: Explain the structure of our galaxy, globular clusters, velocity distribution of stars, fine structure of carbon, origin of spiral arms and its basic features, Interstellar dust and theory of extinction of stellar light etc.</p> <p>CO3: Explain and understand pre-main sequence collapse, origin of the solar system, Jean’s criteria, late stage evolution of stars, red giant phase, white dwarf, supernova, neutron star, black hole, stellar nucleosynthesis etc.</p> <p>CO4: Develop an understanding of simple extragalactic observations, Olber’s paradox, Hubble’s constant and its implications, the steady state universe, Evolution of the Big Bang, time evolution of the future universe etc.</p>
Credits	03 Theory periods of one hour per week over a semester

Course Outcomes	<p>COs of the course “PHY-534(V) –Science of Renewable Energy Sources” Describe general understanding of energy sources, solar energy, hydrogen energy, wind energy, wave energy and oceanic thermal energy conversion and related topics.</p> <p>CO1: Explain and enumerate production alternatives and reserves of energy sources in the world and in India; need of renewable energy sources, energy security and energy conservation, energy and its environmental impacts, distributed generation.</p> <p>CO2: Develop an understanding of solar thermal and solar photovoltaic technologies and their applications.</p> <p>CO3: Explain and understand the hydrogen production techniques, importance of hydrogen energy as per environmental concern, storage techniques and safety issues.</p> <p>CO4: Develop an understanding of wind energy, wave energy and OTEC and their implementation criteria.</p>
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## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

Credits	03 Theory periods of one hour per week over a semester
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Course Outcomes	<p>COs of the course “PHY-535(I)-Nano Physics” Describe general understanding regarding types of Nanomaterials and their Properties, Nanomagnetism, Quantum Wells, Quantum Wells, Synthesis of Nanomaterials(Bottom up Approach, some special nanomaterials and related topics.</p> <p>CO1: Develop an understanding of nanomaterials and their properties: clusters, metal nanocluster, magic number, theoretical modelling of nanoparticles, geometric structures. excitons, effective mass approximation, optical properties of semiconductor nanoparticles and plasmonic materials etc.</p> <p>CO2: Enumerate and explain effect of bulk nanostructuring of Magnetic properties, Dynamics of nanomagnets; Nanopore Containment of magnetic particles, Nanocarbon ferromagnets, Giant and colossal Magnetoresistance, Ferrofluids, spintronics etc.</p> <p>CO3: Explain and understand quantum wells, wires, and dots, Preparation of quantum nanostructures; fermi gas and density of states, potential wells, Partial confinement, properties dependent and density of states.</p> <p>CO4: Develop an understanding the synthesis of Nanomaterials(Bottom up Approach): Synthesis of Nanomaterials (Top down Approach): Ball milling, Lithography.</p> <p>CO5: Explain and understand Some special Nanomaterials: Carbon Nanomaterials, Multiferroics, and Nanostructured Multilayers.</p>
Credits	03 Theory periods of one hour per week over a semester

## **M.Sc. (Physics) Program**

### **Program Outcomes, Program Specific Outcomes, Course Outcome**

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-535(II)–Fibre optics and Non-linear Optics”</b></p> <p>Describe general understanding of Optical fibre and its properties, Fiber fabrication and cable design, Optics of anisotropic media, Electro-optic and acousto-optic effects and modulation of light beams, and Non-linear optics/processes.</p> <p>CO1: Develop an understanding of Optical fibre and its properties.</p> <p>CO2: Enumerate and explain Fiber fabrication and cable design.</p> <p>CO3: Explain and understand Optics of anisotropic media.</p> <p>CO4: Develop an understanding of Electro-optic and acousto-optic effects and modulation of light beams, and Non-linear optics/processes.</p> <p>CO5: Explain and understand Non-linear optics/processes.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-535(III)–Nuclear Technology”</b></p> <p>Describe general understanding of interaction of radiation with matter: Detectors and Instrumentation: Industrial and Analytical Applications: Nuclear Energy Power from Fission:</p> <p>CO1: Develop an understanding of interaction of radiation with matter.</p> <p>CO2: Enumerate and explain Detectors and Instrumentation.</p> <p>CO3: Explain and understand Industrial and Analytical Applications.</p> <p>CO4: Develop an understanding of Nuclear Energy Power from Fission.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

## M.Sc. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcome

<b>Course Outcomes</b>	<p>COs of the course “PHY-535(IV)–Advanced Nuclear &amp; Particle Astrophysics” describe general understanding of the observational basis of nuclear astrophysics, thermonuclear and nuclear reactions in stellar interiors, supernovae, nucleosynthesis of light elements.</p> <p>CO1: Develop an understanding of the observational basis of nuclear astrophysics, the importance of the four fundamental interactions, evolution of stars; the Abundances of Elements in the Universe.</p> <p>CO2: Enumerate and explain Thermonuclear and Nuclear Reactions in Stellar Interiors; Nuclear Reactions: Generalities; Nuclear Reaction Rates.</p> <p>CO3: Explain and understand the Fe photodisintegration mechanism, the C detonation mechanism, the neutrino transport mechanism, deceleration of the central pulsar, the helium flashes, the novae outbursts explosions of super massive stars.</p> <p>CO4: Develop an understanding of nucleosynthesis of light elements, abundances of light elements, spallation reaction.</p> <p>CO5: Explain and understand the basic assumptions, the standard model of the universe, cosmological principle and the expansion of the universe.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course “PHY-535(V)–Advanced Computational Physics” describe general understanding of various advances developed in Computational Physics.</p> <p>CO1: Develop an understanding of concepts of deterministic and stochastic simulation methods, limitations of simulational physics.</p> <p>CO2: Enumerate and explain Monte Carlo Method, Random walk on one, two and three dimensional lattices, self-avoiding walk, micro-canonical ensemble, canonical ensemble, classical ideal gas, Ising model, grand canonical ensemble.</p> <p>CO3: Explain and understand Molecular Dynamics.</p> <p>CO4: Develop an understanding of symbolic computing systems.</p> <p>CO5: Explain and understand computing hardware basics: memory and CPU, components.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

## **M.Sc. (Physics) Program**

### **Program Outcomes, Program Specific Outcomes, Course Outcome**

<b>Course Outcomes</b>	COs of the course “PHY-536-Physics Laboratory – III” Describe general understanding Physics lab experiment and related problems.  CO1: To study temperature-dependence of conductivity of a given semiconductor crystal using four probe method. CO2: To determine the band gap of a semiconductor by Four Probe Method. CO3: To study the temperature dependence of a ceramic capacitor: Verification of Curie-Weiss law for the electrical susceptibility of a ferroelectric material. CO4: To determine the Hall voltage, Hall coefficient and the carrier concentration of a given semi-conductor. CO5: To determine the dielectric constant of a liquid by dipole meter. CO6: To study the modulation & demodulation of AM wave. CO7: To study the modulation& demodulation of FM wave.
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	COs of the course “PHY-599- Research Methodology” Describe general understanding of some basic concepts of research and its methodologies.  CO1: Develop an understanding of need, importance and impact of research, types of research, research process. CO2: Learn about synopsis writing, Selecting research problem; formulation of research projects; survey of literature. CO3: Develop an understanding of formulation and types of hypothesis; collection, maintenance, storage and analysis of data. CO4: Understand compilation and presentation of results, writing of manuscripts; research reports and thesis. CO5: Know about various funding agencies provides financial support for research and writing research proposal for external funding. CO6: Develop an understanding of computer and informatics including word processing, excel, power point presentation etc. CO7: Explain and understand principal and working procedure of various lab instruments.
<b>Credits</b>	03 Theory periods of one hour per week over a semester

**Programme: M.Sc. (Zoology) (Two-year degree programme)**

**PROGRAMME OUTCOMES (POs)**

**PO 1:** Gain a thorough grounding in the fundamentals in different areas of Zoology such as ecology, biodiversity, entomology, developmental biology, applied zoology etc.

**PO 2:** Develop the skill of applying concepts and techniques used in animal sciences.

**PO 3:** Apply ethical principles in animal behaviour, wild life conservation etc.

**PO 4:** Effectively aware the society about human wildlife conflict.

**PO 5:** Develop an attitude to perform effectively and efficiently as a leader as well as a member of a team in a sustainable development.

**PO 6:** Ability to engage in lifelong learning.

**PO 7:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.

**PO 8:** Exposure about museums, zoos, national parks, sanctuaries, apairy, diary, vermicomposts units and laboratories.

**PO 9:** Enabling students to be capable of making decisions at personal and professional level.

**PO 10:** Getting prepared for post graduate studies and other competitive exams in order to achieve success in their professional careers.

**PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** Students will be able to develop, demonstrate and disseminate the knowledge and skills to laymen about climate change, pollution, communicable diseases and biodiversity.

**PSO 2:** Students also acquire skills to work as animal trainers, animals care takers, conservationists, lab technicians, zookeeper, wildlife biologists and many more.

**PSO 3:** Students will be able to play roles of animal breeder, forensic experts, lab technicians etc. which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical or unethical decision making.

**PSO 4:** Students will learn modern techniques such as composite culture such as pisciculture, aquaculture, sericulture, lac culture, oyster culture etc. applying these skills in their future careers in Zoology and other applied fields.



**PSO 5:** Students will be able to develop and demonstrate knowledge of applied zoology in integrated farming system for sustainable development.

**PSO 6:** Students will gain thorough systematic and subject skills within various disciplines of entomology, parasitology, embryology, physiology, ecology and applied zoology (apairy, diary, vermiculture etc.).

**PSO 7:** Learners will be able to recognize the role of zoologist, animals and wild life educators, veterinarian, entomologist, parasitologist etc. which will help learners to possess knowledge and other soft skills.

**PSO 8:** Learners will acquire the skills like effective communication, decision - making, problem solving in day to day life affairs.

**PSO 9:** Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposures therein.

**PSO 10:** Apart from theoretical knowledge learners can also acquire practical skills to work as zoo keeper, wildlife educators, animal trainers, veterinarian and various sectors such as healthcare centres, Pharmaceutical companies, pathology labs, medical camps academic institutions etc.

Course	Course outcomes (COs)
	<b>M. Sc. Zoology (1<sup>st</sup> Sem.)</b>
<b>Biosystematics (ZOO-511)</b>	<p><b>CO 1:</b> Students will learn basics of taxonomy its types, stages of taxonomy and importance of taxonomy in biology. Rules for the classification of organisms, identification criteria and taxonomic characters.</p> <p><b>CO 2:</b> Students will be able to explain various types of species concepts such as typological, biological evolutionary and other kinds of species.</p> <p><b>CO 3:</b> Students will understand morphological, embryological, ecological, behavioural, cytological and biochemical approaches used in taxonomy.</p> <p><b>CO 4:</b> Students will understand various techniques used in taxonomy such as electrophoresis, infrared spectrophotometry, histochemical analysis and DNA hybridization etc.</p>

<b>Structure &amp; Functional Organization of Animal -I (ZOO-512)</b>	<p><b>CO 1:</b> Students will understand basics of nutrition &amp; digestion and mechanism of digestion and regulation of secretion in non-chordates and chordates.</p> <p><b>CO 2:</b> Learners will get knowledge on circulatory system in chordates and non-chordates, types of hearts such chambered, tubular and ampullary hearts, neurogenic and myogenic hearts.</p> <p><b>CO 3:</b> It will equip the students about respiratory system: Types of respiration and types of respiratory organs in aquatic and terrestrial animals. Distribution, role and brief chemistry of respiratory pigments in non-chordates and chordates.</p> <p><b>CO 4:</b> It will brief the students about excretion and osmoregulation. excretory products and excretory structures in non-chordates and chordates.</p>
<b>Evolutionary Biology (ZOO-514)</b>	<p><b>CO 1:</b> Students should know about the evolution of complex organic molecule from complex inorganic compounds and formation of protobionts (first primitive cell).</p> <p><b>CO 2:</b> Equip the students about patterns of similarities and differences among living beings over time and across habitats through action of biological processes such as natural selection, mutation and genetic drift.</p> <p><b>CO 3:</b> Students should learn about phylogeny and evolutionary history of horse and man.</p> <p><b>CO 4:</b> Students should know about geological time scales, eras, epochs and evolution of various animal groups in these ages.</p>
<b>Comparative Vertebrate Endocrinology and Reproduction (ZOO-515)</b>	<p><b>CO 1:</b> Learners will get knowledge on neuro-endocrine glands, structure, secretion, functions and their regulation.</p> <p><b>CO 2:</b> Students will understand mechanisms of hormone action.</p> <p><b>CO 3:</b> Understanding of reproductive patterns and larval forms and their evolution in vertebrates</p> <p><b>CO 4:</b> Students will get knowledge on gametogenesis; Gamete maturation, fertilization, implantation, parturition, lactation and their regulations.</p>

<b>General Microbiology (MICRO-511)</b>	<p><b>CO 1:</b> Students will get knowledge on general history of microbiology, Scope and importance of microbiology. Bacterial cell structure, shapes, cell membrane, cell wall, flagella, capsule, pili, endospores and magnetosomes etc.</p> <p><b>CO 2:</b> Learners will get knowledge on morphology, habitat, life cycle, nutrition and classification of archaea, fungi (yeasts and molds), algae, protozoa and viruses.</p> <p><b>CO 3:</b> It will brief the students about reproduction and growth of microorganisms, growth measurement parameters, Effect of pH, temperature and oxygen on growth of bacteria.</p> <p><b>CO 4:</b> Students will understand about antibiotics: types, properties, mode of action, drug resistance and mechanism of antibiotic resistance in microbes.</p>
<b>General Biochemistry (BIOCHEM-511)</b>	<p><b>CO 1:</b> Learners will get knowledge on classification, structure and functions of carbohydrates, lipids and nucleic acids</p> <p><b>CO 2:</b> Learners will get knowledge on enzymes: structure, classification, mechanism of action, regulation and factors affecting enzyme action.</p> <p><b>CO 3:</b> It will brief the students about photosynthesis and respiration. General metabolism of carbohydrates, proteins and lipids.</p> <p><b>CO 4:</b> Understanding of genetic material its structure, replication, transcription, translation and recombinant DNA technology.</p>
<b>M. Sc. Zoology (2<sup>nd</sup> Sem.)</b>	
<b>Structure &amp; Functional Organization of Animal -II (ZOO-521)</b>	<p><b>CO 1:</b> Students will get knowledge on integumentary system: General features of the Integument, specializations of integument and its evolution in various animal groups.</p> <p><b>CO 2:</b> To understand muscular system: Classification of muscles, structure and chemical and molecular events occurring during muscle contraction.</p> <p><b>CO 3:</b> To understand skeletal system: Exo and endo skeletons in vertebrates and invertebrates.</p>

	<p><b>CO 4:</b> Understanding of sensory system: General sensory organs, free sensory receptors, encapsulated sensory receptors, associated sensory receptors and mechanisms of perceiving stimuli.</p>
<p><b>Embryology (ZOO-522)</b></p>	<p><b>CO 1:</b> To learn about sex determination and mechanism of sex determination. differentiation of gonad and the genital tract. Spermatogenesis: structural and molecular events occurring during spermatogenesis.</p> <p><b>CO 2:</b> To know about Sertoli and Leydig cells their structure and functions: Leydig and Sertoli cell proliferation during foetal and postnatal development.</p> <p><b>CO 3:</b> Learners will understand about male sterility and related conditions such as azoospermia, oligozoospermia, asthenozoospermia, varicocele and genetic basis for male infertility.</p> <p><b>CO 4:</b> To know about reproductive cycles in females such as menstrual cycle in human and estrous cycle in rat.</p>
<p><b>Endocrinology (ZOO-523)</b></p>	<p><b>CO 1:</b> Students will get knowledge on the basic concepts of endocrinology: introduction to the endocrine system, classes of hormones, modes of hormone secretion and comparative aspects of endocrine physiology in vertebrates.</p> <p><b>CO 2:</b> To know about evolution of pituitary gland and physiological actions of pituitary hormones. Evolution of renin-angiotensin system.</p> <p><b>CO 3:</b> To know about evolution of thyroid gland. Thyroid hormone synthesis and its regulation.</p> <p><b>CO 4:</b> To know about pancreatic hormones and its role in glucose homeostasis.</p>
<p><b>Limnology (ZOO-524)</b></p>	<p><b>CO 1:</b> To get basics of Limnology – Definition, historical development and scope of Limnology. Types of freshwater habitats such as ponds, streams and rivers.</p> <p><b>CO 2:</b> Students will get knowledge to analyse methods of water quality testing such as BOD, DO and COD etc.</p> <p><b>CO 3:</b> Students will become aware about resource conservation and other related issues such as aquatic pollution, regulation on discharge of industrial effluents and domestic wastes in rivers and reservoirs.</p>

	<p><b>CO 4:</b> Students will be able to understand about use and misuse of inland waters.</p>
<p><b>Insect and Environment (ZOO-525)</b></p>	<p><b>CO 1:</b> Students will get knowledge about apiculture, sericulture and Lac culture</p> <p><b>CO 2:</b> Students will understand the importance of insects as biological control agents, insects as pollution indicator, insects as food, Insects as scavengers and Insects as pollinators.</p> <p><b>CO 3:</b> Students will know about the role of insects in pharmacy and in forensic investigations.</p> <p><b>CO 4:</b> Students will get knowledge about various types of adaptations (Morphological, Ecological, Physiological) found in insects at high altitudes.</p>
<p><b>Plant and Animal Biotechnology (BT-507)</b></p>	<p><b>CO 1:</b> To equip the students about plant and animal biotechnology: historical perspectives, laboratory organization and tissue culture media.</p> <p><b>CO 2:</b> Students will get knowledge about molecular markers, construction of maps, molecular breeding and DNA fingerprinting.</p> <p>Also successful examples drought resistant plants such as transgenic papaya, Bt cotton, flavr savr tomato and golden rice.</p> <p><b>CO 3:</b> Students will get knowledge on animal cell culture. Different types of culture media and application of animal cell culture along with cryopreservation of cell lines, also in-vitro fertilization, embryo transfer technology and animal cloning.</p> <p><b>CO 4:</b> Understanding of stem cells applications in medicine and tissue engineering technologies.</p>
<p><b>Molecular Biology and Genetic Engineering (MICRO-524)</b></p>	<p><b>CO 1:</b> Understanding of genetic material: Structure of DNA, replication, DNA damage and repair; Types of RNA and their role in gene expression.</p> <p><b>CO 2:</b> Understanding of translation; components involved, t-RNA as adapter, genetic code and its salient features.</p> <p><b>CO 3:</b> To get knowledge on cloning strategies: cloning of genomic DNA, cDNA cloning, selection and characterization of clones.</p>



	<b>CO 4:</b> To learn about PCR: principle, types and role in molecular biology.
M. Sc. Zoology (3 <sup>rd</sup> Sem.)	
<b>Cytogenetics</b> <b>(ZOO-531)</b>	<b>CO 1:</b> To understand Mendelian principles of heredity. <b>CO 2:</b> To understand chromosomal aberrations <b>CO 3:</b> Polyploidy and its significance. <b>CO 4:</b> Students will get knowledge about mutations such as spontaneous and induced, physical and chemical mutagens.
<b>Research Methodology</b> <b>(ZOO-599)</b>	<b>CO 1:</b> To equip the students about history, myths and ethnic practices and research process. <b>CO 2:</b> To know about how to write synopsis of research projects etc. <b>CO 3:</b> To know the importance of computer and informatics in research. <b>CO 4:</b> Students should be aware about the current status and future prospects of research
<b>Tools and Techniques in Biology</b> <b>(ZOO-532)</b>	<b>CO 1:</b> Students will be get knowledge about microscopy, its principle & applications along with the other techniques used in biochemistry and microbiology. <b>CO 2:</b> Students will get knowledge about chromatography, electrophoresis their principles, type and applications. Radioisotopes and main isotope techniques in biology. <b>CO 3:</b> Students will learn about histological techniques: Principles of tissue fixation, microtomy, staining, mounting and other parameters used in histochemistry. <b>CO 4:</b> Students will study various cell culture techniques: Culture media, essential components and preparation, cell viability and testing etc.
<b>Computational Biology &amp; Biostatistics</b> <b>(BT-505)</b>	<b>CO 1:</b> Students will understand basics of biostatistics, concept of variables in biological systems, collection, classification, tabulation, graphical and diagrammatic representation of numerical data.

	<p><b>CO 2:</b> Students will learn about correlation and regression coefficients; curve fitting by least squares methods.</p> <p><b>CO 3:</b> Understanding of DNA microarrays, databases and data management cluster analysis.</p> <p><b>CO 4:</b> To equip the students with gene finding algorithms and Hidden Markov Models (HMM) softwares.</p>
<p><b>Parasitology</b> <b>(ZOO-534)</b></p>	<p><b>CO 1:</b> Indepth understanding of protozoology: Brief history of protozoology, ecology and host parasite relationship along with zoonotic potentiality of protozoa.</p> <p><b>CO 2:</b> Students will learn about morphology, life cycle, pathology, symptomatology, laboratory diagnosis and treatment of some pathogenic and non-pathogenic protozoans.</p> <p><b>CO 3:</b> Students will learn about morphology, life cycle, pathology, symptomatology, laboratory diagnosis and treatment of some pathogenic helminths.</p> <p><b>CO 4:</b> Students will learn about arthropod vectors of human diseases. Classification and general characteristics of important insect vectors and mode of transmission of various diseases.</p>
<p><b>Entomology</b> <b>(ZOO-535)</b></p>	<p><b>CO 1:</b> Students will understand the history of entomology in India. Factors for insect abundance and classification of phylum arthropoda upto orders.</p> <p><b>CO 2:</b> Students will get knowledge about insect morphology: Body segmentation, structure of Head, thorax and abdomen. Structure and modifications of insect antennae, mouth parts and legs. Wing venation, modifications and wing coupling apparatus. Structure of male and female genitalia.</p> <p><b>CO 3:</b> Students will learn about sensory system and sensory organs found in insects.</p> <p><b>CO 4:</b> Students will be able to understand metamorphosis and diapause in insects.</p>

**Department of Botany**  
**Akal College of Basic Sciences**

**Learning Outcomes**  
**Ph.D. Botany**



**ETERNAL UNIVERSITY**  
**Baru-Sahib, Sirmaur (H.P.)**

**Eternal University, Baru Sahib (HP)**  
**Master of Science (M Sc Botany)**

Semester	Course code	Course name	L	T	P	D
<b>I</b>	BOT-601	Research Methodology	3	0	0	0
	BOT-602	Instrumental Methods of Analysis	3	0	0	0
	BOT-691	Seminar	0	1	0	0
	BOT-701	Dissertation	0	0	0	5
		<b>Sub Total</b>	<b>6</b>	<b>1</b>	<b>0</b>	<b>5</b>

**(Optional Course-I)**

Semester	Course code	Course name	L	T	P	D
<b>I</b>	BOT-603	Recent advances in botany	3	0	0	0
	BOT-604	Taxonomy of Angiosperms & Gymnosperms	3	0	0	0
	BOT-605	Phycology	3	0	0	0
	BOT-606	Biochemistry & Molecular Biology of Plants	3	0	0	0
	BOT-607	Bryophytes & Pteridophytes	3	0	0	0
		<b>Sub Total</b>	<b>3</b>			

**Optional Course-II)**

Semester	Course code	Course name	L	T	P	D
<b>I</b>	BOT-608	Plant resources & Utilization	3	0	0	0
	BOT-609	Plant Physiology	3	0	0	0
	BOT-610	Cytogenetics & Plant Breeding	3	0	0	0
	BOT-611	Plant Pathology	3	0	0	0
	BOT-612	Mycology	3	0	0	0
		<b>Sub Total</b>	<b>3</b>			

Semester	Course code	Course name	L	T	P	D
<b>II</b>	BOT-692	Synopsis Seminar	0	1	0	0
<b>III</b>	BOT-701	Dissertation	0	0	0	15
<b>IV</b>	BOT-701	Dissertation	0	0	0	15
<b>V</b>	BOT-701	Dissertation	0	0	0	15
<b>VI</b>	BOT-701	Dissertation	0	0	0	15
		<b>Sub Total</b>	<b>0</b>	<b>1</b>	<b>0</b>	<b>75</b>

## **Doctor of Philosophy PROGRAMME OUTCOMES (POs)**

- PO1:** Qualified doctors in the philosophical background in the biology of plants.
- PO2:** Qualified professional Botanists: Plant Taxonomists, Phyto-Physiologists, Phyto-Geneticist, Ecologist, and many more in the field of teaching and scientific research.
- PO3:** Help in meeting the manpower requirements of institutions of lower as well as higher learning and research centres by providing qualified professional plant biologists.
- PO4:** Influential contributions to scientific discovery and engage in formal and informal teaching and mentoring, and progress to careers in academia, industry, government and non-governmental organizations.
- PO5:** Practically skilled and theoretical sound, educated botanists in the mission of Nation - building process with knowledge of plant molecules to the organism level - by covering a wide range of scientific disciplines concerned with the study of plants.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs): PhD – Botany**

- PSO1: Scientific knowledge and understanding of:** Wide range of scientific disciplines concerned with the study of plants, which includes Bryology, Pteridology, Gymnosperms, Plant Resource Utilization, Angiosperms: Phylogeny & Embryology, Phycology, Cell & Molecular Biology, Plant Anatomy, Taxonomy of Angiosperms, Cytogenetics & Plant Breeding, Environmental Botany, Mycology, Biochemistry and Molecular Biology of Plants, Plant & Animal Biotechnology, Forestry, Comprehensive Test & Field Botany, Plant Pathology, Plant Physiology, Research Methodology, Computational Biology & Biostatistics, Genetic Engineering.
- PSO2: Practical skills:** To write and conduct independent research under mentorship; To identify the diverse group of plants and their pathogens from the environment; To perform and present self before the challenging teaching and research problems; To carry out practical work, in the field and in the laboratory, with precaution and minimal risk; To conduct vegetation and biochemical analyses of plants; Knowledge of appropriate statistical methods and computer basics.
- PSO3: Intellectual skills:** To generate logical thinking to solve the problem in effective and practical manner; To assimilate knowledge and ideas to plan and conduct an independent project; To construct and test the hypothesis to execute the real problems of plant sciences.
- PSO4: Use of modern scientific instruments & tools:** Understanding of principle, procedure, methodology, application of instrumentation, their precaution and limitations. Use of modern instruments and equipment for Biochemical analysis & estimation, Molecular Biology, Biotechnology, Plant Tissue culture experiments, cellular and physiological activities of plants.



**PSO5: Moral principles & ethics:** To be morally responsible and ethical-conduct towards sustainability of biodiversity, environment and conservation.

### **COURSE OUTCOMES (COs)**

**Subject: Research Methodology**

**Subject Code: BOT – 601**

**CO1:** Understanding the concept of research, research applications in functional areas of business and emerging trends in Botany research.

**CO2:** Elaborate the scientific method of research, formulation of research projects, steps in research process and preparation of synopsis.

**CO3:** Understanding the qualities of a good hypothesis and concept of hypothesis testing and test of significance.

**CO4:** Understanding MS word, MS excel, and MS PowerPoint, graph and figure plotting.

**CO5:** Elaborate the concept & need of sampling and types of sampling.

**CO6:** Understanding scaling techniques and types of data.

**CO7:** Understanding the data analysis, graphical representation of data and writing of manuscripts.

**Subject: Instrumental Methods of Analysis**

**Subject Code: BOT – 602**

**CO1.** Principle, working and applications of Microscopy and spectroscopy.

**CO2.** To understand the advancement in Radio-isotopy.

**CO3.** Elaborate the concept of Chromatography techniques.

**CO4.** To understand the process and function of different electrophoresis techniques.

**CO5.** To acquaint with principle, working and applications of dialysis, microfiltration, centrifugation and hydro-dynamic methods.

**CO6.** To learn methods of DNA and peptide sequences.

**Subject: Seminar**

**Subject Code: BOT – 691**

**CO1:** To acquaint the students with natural flora and fauna in various regions through field trips.

**CO2:** To organizing botanical excursions and visits to various herbaria and botanical gardens of the country.

**CO3:** Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

**CO4:** Demonstrate the applicability of field report on the basis of their excursion tours.

**CO5:** Understanding the concept of field botany and their application in comprehensive test based on it.

**Subject: Dissertation**

**Subject Code: BOT – 701**

**CO1:** To acquaint the students with dissertation work.

**CO2:** Demonstrate the research topic assigned.

**CO3:** Understand the concepts of given research topic and analyze and solve the problem.

**CO4:** To submit thesis for evaluation of students and they required to collect, analyze the data and submit their dissertation.

**Subject: Recent Advances in Botany**

**Subject Code: BOT – 603**

- CO1.** To know the diversified habitats of cryptogams,
- CO2.** To understand the recent advancement in biodiversity assessment and conservation.
- CO3.** Elaborate the concept of recent advancement in plant physiology.
- CO4.** To understand the process and function of cellular totipotency, somatic embryogenesis and use of tissue culture in agroforestry.
- CO5.** To acquaint with recent advancement in cytogenetics, molecular biology, plant breeding and transgenics.
- CO6.** To learn about the scope and importance of Biotechnology.

**Subject: Taxonomy of Angiosperms & Gymnosperms    Subject Code: BOT – 604**

- CO1:** To acquaint the students with significance, aims and procedures of plant taxonomy; Alpha- and Omega- taxonomy; Biosystematics.
- CO2:** Demonstrate the herbaria practices, and Botanical gardens.
- CO3:** Understand the concepts of diagnostic keys, ranks of taxa and nomenclature of taxa according to their ranks.
- CO4:** Understanding the plant nomenclature and the International Code of Botanical Nomenclature (ICBN).
- CO5:** Understanding the concept of numerical taxonomy.
- CO6:** Understanding the Botanical Survey of India, its organization and role.

**Subject: Phycology**

**Subject Code: BOT – 605**

- CO1:** Understand the concepts and salient features of different taxonomic categories of algae.
- CO2:** Demonstrate the structure and function of thallus organization in algae.
- CO3:** Understand the current concepts and relationships of prochlorophycean algae.
- CO4:** Demonstrate the rhythms and bioluminescence in dinoflagellates.
- CO5:** Understanding the economic importance of algae.

**Subject: Biochemistry & Molecular Biology of Plants    Subject Code: BOT–606**

- CO1:** To acquaint the students with structure and function of cell organelle.
- CO2:** Demonstrate the synthesis and transport of sucrose.
- CO3:** Understand the concepts of biochemistry of seed germination and development, biochemistry of fruit ripening, phytohormones and their mode of action, signal transduction.
- CO4:** Understanding the concept of nitrogen fixation and nitrate assimilation, sulphate reduction and incorporation of sulphur into amino acids.
- CO5:** Understanding the concept of biochemistry and significance of secondary metabolites.
- CO6:** Understanding the concept of molecular biology of various stresses.

**Subject: Bryophytes & Pteridophytes**

**Subject Code: BOT – 607**

- CO1:** Understand the concepts and salient features of different taxonomic categories of bryophyta.
- CO2:** Demonstrate the structure and function of Antheridia and Archegonia in major taxonomic groups of bryophytes.

- CO3:** Understand the concepts related to evolution of sporophyte in bryophytes, conduction and water relations.
- CO4:** Demonstrate the epiphytes, epiphylls; epiliths litter species fire mosses, coprophilous species, calcicoles and calcifuges, halophytes, epizoic bryophytes.
- CO5:** Understanding the concept of dispersal of bryophyte diaspores, major patterns of bryophyte distribution.
- CO6:** Understand the concepts and salient features of different taxonomic categories of Pteridophyta.
- CO7:** Demonstrate the structure and function of comparative morphology of the sporophyte, stelar system, sporangial characteristics.
- CO8:** Understand the spore structure, types and patterns of spore germination in ferns.
- CO9:** Demonstrate the natural and induced apogamy and apospory in pteridophytes.
- CO10:** Understanding the utility concept of ferns for phytoremediation, ferns as hyper accumulators of arsenic, mechanism of uptake, transfer and tolerance.

**Subject: Plant Resource and Utilization**

**Subject Code: BOT – 608**

- CO1:** Demonstrate the center of origin and uses of minor cereals, oil crops and legumes.
- CO2:** Understand the concepts related to psychoactive drugs and narcotics: source, botany, active principle and commercial significance.
- CO3:** Demonstrate the concepts related to medicinal plants and their classification with reference to obtained drugs.
- CO4:** Demonstrate the concepts related to aromatic plants and their classification with reference to obtained drugs.
- CO5:** Understanding the concept of uses of plant-based insecticides.

**Subject: Plant Physiology**

**Subject Code: BOT – 609**

- CO1:** To acquaint the students with recent concepts of structure and composition of membrane with various classes of pumps and their significance.
- CO2:** Demonstrate the plant respiration.
- CO3:** Understand the concepts of photosynthesis.
- CO4:** Understanding the concept related to nitrogen fixation by free and symbiotic organisms.
- CO5:** Understanding the concept of plant hormones.
- CO6:** Understanding the concept related to reproductive physiology, phytochrome/hormones in reproduction, stress physiology, secondary metabolites.

**Subject: Cytogenetics & Plant Breeding**

**Subject Code: BOT – 610**

- CO1:** To acquaint the students with genomes organization in prokaryotes and eukaryotes.
- CO2:** Demonstrate the organization of plastid and mitochondrial genomes.
- CO3:** Understand the concepts of chromosome structure and DNA packaging, euchromatin and heterochromatin, karyotype analysis and banding patterns.
- CO4:** Understanding the enzymes involved in replication, polymerase, topoisomerase, methylase, nucleases and restriction endonucleases.
- CO5:** Understanding the concept of genetic recombination, and sex determination.
- CO6:** Understanding the concept of principles of plant breeding.

**Subject: Plant Pathology**

**Subject Code: BOT – 611**

- CO1:** To acquaint the students with history of plant pathology and pathogenesis.

**CO2:** Demonstrate the enzymes and toxins in plant diseases.

**CO3:** Understand the concepts of host parasite interaction, alteration in plant physiological functions and defense mechanisms in plants.

**CO4:** Understanding the concept of resistance and susceptibility, vertical and horizontal resistance, mutation, heterokaryosis, transformation, transduction and physiological specialization.

**CO5:** Understanding the concept of plant pathogens dispersal and diseases forecasting.

**CO6:** Understanding the concept related to cultural and chemical control, breeding for disease resistance.

**Subject: Mycology**

**Subject Code: BOT – 612**

**CO1:** To acquaint the students with introduction to fungi and their significance to humans.

**CO2:** Demonstrate the characteristics of fungi and fungal systematic.

**CO3:** Understand the general account, structure and reproduction of Chytridiomycota, Myxomycota, Oomycota, Zygomycota, Ascomycota, Basidiomycota and mitotic fungi.

**CO4:** Understanding the concept related to rust and smut fungi.

**CO5:** Understanding the detailed account of the different orders with specific reference to *Saprolegnia*, *Achlya*, *Legninidium*, *Pythium*, *Phytophthora* and *Albugo*.

**Subject: Synopsis Seminar**

**Subject Code: BOT – 692**

**CO1:** To acquaint the students with natural flora and fauna in various regions through field trips.

**CO2:** To organizing botanical excursions and visits to various herbaria and botanical gardens of the country.

**CO3:** Analyze effective application of management principles to diagnose and solve organizational problems and develop optimal managerial decisions.

**CO4:** Demonstrate the applicability of field report on the basis of their excursion tours.

**CO5:** Understanding the concept of field botany and their application in comprehensive test based on it.

## **Program: Ph.D. (Chemistry)**

### **PROGRAM OUTCOMES (POs)**

**PO 1:** Constructing a concrete foundation for theoretical, quantitative, and logical thinking that underlies theories and models related to the chemical sciences

**PO 2:** Integrate concepts and ideas learned in theory with skills learned in laboratories to formulate hypotheses, collect & compile data to deduce results and draw logical conclusions.

**PO 3:** To develop skills to use of both classical and modern tools for investigation of chemical systems.

**PO 4:** Exploring new areas of research in interdisciplinary and multidisciplinary areas.

**PO 5:** Design proper procedures and rules for safety and handling of chemicals.

**PO 6:** Create awareness of the benefits and impacts of chemistry on environment, society and other disciplines outside the scientific community.

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO1:** Learners will get advanced understanding in the area of characterization techniques in chemistry.

**PSO2:** Students will understand chemical and molecular processes in chemical reactions.

**PSO3:** Students will gain knowledge of design and perform experiments efficiently and effectively, and analyze the data to draw conclusions.

**PSO4:** Developing a mechanistic understanding of selectivity and synthetic strategy and research skills applicable to modern chemistry.

**PSO5:** Learners can also acquire practical skills to work as chemist, faculty and other industrial supporting services.



<b>Ph.D. (Chemistry)</b>	
<b>Course</b>	<b>Course Outcomes (COs)</b>
<b>Nanomaterial and Applications (CHEM-601)</b>	<p>CO1: To know historical developments, synthesis, characterization and important applications of nanomaterials.</p> <p>CO2: Learn the physicochemical properties of nanomaterials and Preparation of nanostructured oxides.</p> <p>CO3: Understanding the influence of nanomaterials on health, communication, Energy, Environment, safety, security and defence.</p> <p>CO4: Enhance the sufficient scientific background to advanced inorganic materials and metal chalcogenides, and their characterization by modern techniques.</p> <p>CO5: To understand the importance of nanotechnology for sustainability, Nanomedicine, Environmental, health, and safety issues.</p>
<b>Advance Physical Chemistry (CHEM-602)</b>	<p>CO1: Learner will come to know the various techniques for preparation of Materials and applications in solid state devices.</p> <p>CO2: To know the kinetics of redox reactions, catalysis, their types and theories of catalysis. General mechanism, difference between phase transfer and micellar catalysis.</p> <p>CO3: To understand the structure of liquids, relationship between structure and the thermodynamics properties, influence of solute on structure of water and structure of water near a surface.</p> <p>CO4: Enhance scientific background to dipolar interactions, dipolar molecules in gases and liquids, methods for determination of dipole moments.</p>
<b>Advance Organic Chemistry (CHEM-603)</b>	<p>CO1: Enhance the sufficient scientific background to Neighbouring Group Mechanism, Neighbouring Group (NG) participation by <math>\pi</math> and <math>\sigma</math> bonds.</p> <p>CO2: To understand isotope effect, its origin and importance in determining reaction mechanism.</p> <p>CO3: Enhancing the knowledge in stereochemistry, methods of determination of Chemical transformation, Asymmetric Synthesis and Quaciracemates.</p>

	CO4: To understand some naming rearrangements in organic reactions.
<b>Structure from Spectra (CHEM-604)</b>	<p>CO1: To learn basic principle of Ultra-violet spectroscopy and its application to study absorption maximum for dienes, polyenes, carbonyl compounds and <math>\alpha,\beta</math>-unsaturated carbonyl compounds using Woodward rule.</p> <p>CO2: To understand importance infrared spectroscopy, Fingerprint region and interpretation of IR spectra in synthetic or natural products chemistry.</p> <p>CO3: To learn interpretation of spectra, chemical shift, shielding mechanism and anisotropic effects, chemical exchange and chemical exchange and chemical shifts in chiral molecules in NMR Spectroscopy and CMR Spectroscopy.</p> <p>CO4: To know principle, working , interpretation of spectra by using Mass Spectrometry</p>
<b>Advance Inorganic Chemistry (CHEM-605)</b>	<p>CO1: Learner will come to know about principle, working and types of electrodes used in polarography - Electro analytical Techniques.</p> <p>CO2: To understand Principles, theory and applications of Amperometry, Coulometry and AC Polarography.</p> <p>CO3 To know about Phosphorescent Materials, light emitting diodes, types and principle of organic light emitting diodes.</p> <p>CO4: To understand general characteristics of different types of main group organometallics, their stability and routes of M-C bond formation.</p>
<b>Disconnection Approach and Heterocyclic Chemistry (CHEM-606)</b>	<p>CO1: To know the application of stereochemistry in organic synthesis.</p> <p>CO2: To understand the use and application of disconnection approach for organic synthesis.</p> <p>CO3: Learner will know the basic principles of green chemistry and application of non-conventional techniques in organic synthesis</p> <p>CO4: To learn general synthesis of compounds with three or more heteroatoms in the ring</p>
<b>Research Methodology (CHEM-609)</b>	<p>CO1: The students would learn about various research methods used in research.</p> <p>CO2: To know how to do survey of literature in specific field and how to write synopsis for research proposal.</p>

	<p>CO3: To understand research as career; current status and future prospects of a specific research field.</p> <p>CO4: To learn experimental designs, sampling designs, recording of observation, measurement and scaling techniques.</p>
<b>Seminar (CHEM-607)</b>	CO1: Learning how to pick a problem for their research project and to provide latest facts and updated information by consulting latest editions of textbooks, reference books, monographs and peer-reviewed national & international research journals.
<b>Dissertation (CHEM-701)</b>	CO1: Students will learn how to work on a research topic assigned to him/her by their supervisor/mentor with a purpose to develop a collective approach to study, analyze and solve the problem.

## **Programme Ph.D. Mathematics**

### **PROGRAM OUTCOMES (POS)**

PO 01: Students archive knowledge of different branches of Mathematics.

PO 02: Develop the skill of formulating real word problem into mathematical models.

PO 03: Handling different industrial problem and their solutions.

PO 04: Applying different Numerical techniques in solution of linear and non-linear real-world problem.

PO 05: Applying different software in research work.

PO06: Enhance the Logical approach in different fields.

PO 07: Enhance ethical knowledge.

PO 08: Handling different type problems with patience.

PO 09: Programming capacity of the students increases.

PO10: learners apply his/her knowledge for betterment of the society.

### **PROGRAM SPECIFIC OUTCOMES (PSOs)**

PSO 01: After completion of this program mentally thinking power will by high.

PSO 02: Reasoning and analytical approach increases.

PSO 03: Students get good job in research and industry after completion this program.

PSO 04: After completion this program mentally thinking power will by high

PSO 05: learners become good manager since they understand different optimization techniques.

PSO 06 It refines the mental ability of the students.

PSO 07 Learners knowledge uplift the society.

## Ph.D. Mathematics

### Course outcome

Course	Course Outcome (COs)
	Ph.D. Mathematics
Research Methodology (MATH-609)	CO 01: Student will be able to learn how to write synopsis. CO 02: Student will be able to understand about basic terms of statistics. CO 03 : Student will be able to learn application of computer fundamentals in research . CO 04: Student will be understood about plagiarism and IPR.
Stochastic Processes and its application (MATH-622)	CO 01: Student will be understood about probability theory. CO 02: Student will be understood about different type distributions. CO 03: Student will be able to solve gambler's ruin. CO 04: Student will be understand Chapman Kolmogorov equations.
Fuzzy Set Theory (MATH-623)	CO 01: Student will be able to differentiate between fuzzy set and crisp set. CO 02: Student will be understand about Fuzzy union algebraic sum and bounded sum in Fuzzy set theory. CO 03: Student will be able to understand Fuzzy Equations, Fuzzy number, Convex Fuzzy set. CO 04: Student will be understand about Fuzzy morphism.
Operation Research: Theory and its Applications (MATH-624)	CO 01: Student will be able to understand hyper surface and convex theory. CO 02: Student will be able to solve LPP. CO 03: Student will be able to solve transportation problem. CO 04: Student will be able to solve Two person zero sum game.
Optimization Techniques (MATH-625)	CO 01: Student will be able to understand the convex hull. CO 02: Student will be able to solve LPP. CO 03: Student will be able to solve Lagrangian dual problem.



	CO 04: Student will be able to understand first and second order optimality conditions.
Genetic Algorithms , Artificial Neural Networks and Applications (MATH-626)	CO 01: Student will be able to understand applications of the genetic algorithm. CO 02: Student will be able to solve TSP. CO 03: Student will be able to understand solve artificial neural networks CO 04: Student will be able to understand image processing and computer vision.
Application of Finite Element Method in Mathematical Modeling (MATH-627)	CO 01: Student will be able to understand different type polynomial approximations. CO 02: Student will be able to understand Mathematical Modeling. CO 03: Student will be able to solve Eigen value Problems. CO 04: Student will be able to understand heat and wave equations.
Digital Image Processing (MATH-628)	CO 01: Student will be able to understand about fundamentals of image processing. CO 02: Student will be able to understand about image restoration. CO 03: Student will be able to understand about image compression. CO 04: Student will be able to understand the Fourier transformation.
Digital Image Processing (MATH-628)	CO 01: Student will be able to understand about fundamentals of image processing. CO 02: Student will be able to understand about image restoration. CO 03: Student will be able to understand about image compression. CO 04: Student will be able to understand the Fourier transformation.
Graph Theory and its applications (MATH-629)	CO 01: Student will be able to understand about fundamentals of graph. CO 02: Student will be able to understand about automorphism and Cayley graph. CO 03: Student will be able to understand about minimum and maximum imbedding. CO 04: Student will be able to understand graphical measurement.
Foundations of Fourier and Wavelet	CO 01: Student will be able to understand metric space and Normed linear space CO 02: Student will be able to understand about Fourier series

Analysis (MATH-630)	. CO 03: Student will be able to understand about Fourier transform. CO 04: Student will be able to understand about wavelet transform.
Advanced Time Frequency-Wavelet Transform Methods and their Applications Analysis (MATH-631)	CO 01: Student will be able to understand Fourier analysis. CO 02: Student will be able to understand about time frequency methods. CO 03: Student will be able to understand about orthogonal wavelet packets CO 04: Student will be able to understand about estimation in wavelet.
Advanced Fluid Mechanics (MATH-632)	CO 01: Student will be able to understand behaviour of fluids . CO 02: Student will be able to understand velocity and acceleration of fluids. CO 03: Student will be able to understand about steady flow. CO 04: Student will be able to understand behaviour of waves in liquid.
Dynamical System (MATH-633)	CO 01: Student will be learn about linear and nonlinear dynamical system. CO 02: Student will be learn about circuit theory. CO 03: Student will be able to understand about bifurcation theory. CO 04: Student will be able to understand about stability analysis.
Topology and Differential Geometry (MATH-634)	CO 01: Student will be learn about topological space. CO 02: Student will be able to understand about manifolds. CO 03: Student will be able to understand about different type bundles. CO 04: Student will be able to understand about lie algebra.
Commutative Algebra (MATH-635)	CO 01: Student will be learn about rings and modules. CO 02: Student will be learn about ideal domain. CO 03: Student will be able to understand Dedekind domain. CO 04: Student will be able to understand about fractional ideals.
Applied Functional Analysis (MATH-636)	CO 01: Student will be learn about Normed linear and Banach spaces. CO 02: Student will be learn about dual space. CO 03: Student will be able to understand about spectral theory.

	CO 04: Student will be able to understand about compact operators.
Analysis (MATH-637)	CO 01: Student will be learn about linear transformation. CO 02: Student will be learn about measure theory. CO 03: Student will be learn about lebesgue integran and its convergence. CO 04: Student will be learn about convex function
Numerical Techniques and its Application in Differential equation (MATH-638)	CO 01: Student will be able to solve linear algebraic equations. CO 02: Student will be able to solve BVP. CO 03: Student will be able to understand least square method. CO 04: Student will be learn about different numerical Methods.

**Ph.D. (Physics) Program**  
**Program Outcomes, Program Specific Outcomes, Course Outcomes**

<b>Program Outcomes</b>	<b>Ph.D. (Physics) Program</b>
PO1.	<b>Scientific knowledge:</b> Apply the knowledge of physics fundamentals to the solution of specific research problems.
PO2.	<b>Problem analysis:</b> Identify, formulate, research literature, and analyze research related problems using basic principles of physics.
PO3.	<b>Conduct investigations of research problems:</b> Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO4.	<b>Modern tool usage:</b> Apply appropriate techniques, resources, and modern scientific & engineering techniques to complex research related physical activities with an understanding of the limitations.
PO5.	<b>Research Proficiency:</b> Apply various modern techniques for research specific activities/experiments and analysis purpose
<b>Program Specific Outcomes</b>	<b>PSOs of Ph.D. (Physics) Program</b>
PO1.	Understand the concepts of research fundamentals and methodology
PO2.	Perform procedures/experiments as per standards
PO3.	Apply the scientist knowledge for the analysis and interpretation of the simulated/experimental outcomes
PO4	Skill of writing scientific reports and articles as per international standards

## Ph.D. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-601(1)–Advanced Nano Physics”</b> Describe general understanding of nanoscience and nanotechnology, Fundamental behavior of 0-D, 1-D, 2-D, and 3-D materials, Quantum Wells, Wires, and Dots, Carbon Nano Structures and related topics.</p> <p>CO1: Develop an understanding of popular and scientific prospective of nanotechnology, classification of nanomaterials, density of states for 0-D, 1-D, 2-D, and 3-D materials, Quantum confinement, superlattices.</p> <p>CO2: Enumerate and explain structure determination by X-ray diffraction, reciprocal lattice, structure factor, size effect on X-ray diffraction, magnetoresistance etc.</p> <p>CO3: Explain and understand synthesis techniques for the preparation of nanoparticles; bottom up approach: sol-gel synthesis, hydrothermal growth, thin film growth (i.e. CVD, PVD).</p> <p>CO4: Develop an understanding size effect on shape of materials, size effect on electronic properties– magic number, grain boundary effect, semiconductor nanoparticles; Plasmonic nanoparticles,</p> <p>CO5: Explain and understand some special nanomaterials: Carbon nano Structures: Fullerenes, C60, C80 SWNT and MWNT; nanocomposites: Metal-Metal nanocomposites, Polymer-Metal nanocomposites, ceramic nanocomposites.</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course <b>“PHY-602– Advanced Condensed Matter Physics”</b> Describe general understanding of advancement of condensed matter physics and related problems.</p> <p>CO1: Linear and nonlinear dielectric properties of Materials: dielectric constants and Polarization mechanisms, linear dielectric materials etc.</p> <p>CO2: Enumerate and explain theory of magnetism: dia- and para-Ferro-, ferri- and anti-ferromagnetism magnetism in materials, Pauli paramagnetism, and Exchange interaction. Heisenberg Hamiltonian– mean field theory;.</p> <p>CO3: Explain and understand optical properties and optical transition; optical Processes and Excitons.</p> <p>CO4: Develop an understanding of many electron theory, Hartree-Fock theory, Second quantization formalism; Interactions of Electrons and Phonons with Photons</p> <p>CO5: Develop an understanding of Basic concepts in point defects, line defects, planner defects and dislocations in solids.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester



## Ph.D. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-603– Advanced Quantum Mechanics</b>” describe general understanding of special theory of relativity, covariant formulation of electrodynamics, radiation from accelerated charges, general theory of relativity and related problems.</p> <p>CO1: Develop an understanding of solutions of Schrödinger Equation for 1-D and 3-D square wells and potential barriers, H-atom, harmonic oscillator in matrix mechanics etc.</p> <p>CO2: Enumerate and explain approximation methods: Non-degenerate and degenerate perturbation theory and application to anharmonic oscillator, variational method with application to ground state of harmonic oscillator and hydrogen atom.</p> <p>CO3: Explain and understand time dependent perturbation: General expression for the probability of transition from one state to another, Fermi’s golden rule and its application to radiative transition in atoms.</p> <p>CO4: Develop an understanding of relativistic quantum mechanics: The Klein–Gordon equation. The Dirac equation. Dirac matrices, spinors.</p> <p>CO5: Explain and understand identical Particles: Symmetric and antisymmetric wave functions: Bosons and Fermions. Summarization postulates,</p> <p>CO6: Explain and understand Quantum Field Theory.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-608– Renewable Energy Sources and Technologies</b>” Describe general understanding of energy sources, solar energy, hydrogen energy, wind energy, wave energy and oceanic thermal energy conversion and related topics.</p> <p>CO1: Explain and enumerate production alternatives and reserves of energy sources in the world and in India; need of renewable energy sources, energy security and energy conservation, energy and its environmental impacts, distributed generation.</p> <p>CO2: Develop an understanding of solar thermal and solar photovoltaic technologies and their applications.</p> <p>CO3: Explain and understand the hydrogen production techniques, importance of hydrogen energy as per environmental concern, storage techniques and safety issues.</p> <p>CO4: Develop an understanding of wind energy, wave energy and OTEC and their implementation criteria.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

## Ph.D. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-604– Advanced Materials Science</b>” Describe general understanding crystal structure of various materials, chemical bonding in solids, synthesis and characterization techniques of materials and related topics.</p> <p>CO1: Develop an understanding of crystalline and non-crystalline materials; classification of crystals; bravais lattices; symmetry in crystals, some special crystal structure.</p> <p>CO2: Enumerate and explain bonding in materials; phase transitions, magnetic, dielectric materials, high T<sub>c</sub> superconductors, nanomaterials, alloys, semiconductors, polymers, ceramics, composites, solar energy materials, imperfection in a crystal.</p> <p>CO3: Explain and understand single crystal growth, chemical route synthesis, thin film preparation techniques; synthesis of nanomaterials: top down and bottom up approaches of synthesis of nano-structured materials, advanced materials in 3D printing.</p> <p>CO4: Develop an understanding of basic principal and application of XRD, Raman spectroscopy, XPS, STM, AFM, TEM, SEM.</p> <p>CO5: Develop an understanding of basic principal and application of IR, UV-Visible, Dielectric spectroscopy, VSM, SQUID.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-605– Advanced Computational Physics</b>” describe general understanding of various advances developed in Computational Physics.</p> <p>CO1: Develop an understanding of concepts of deterministic and stochastic simulation methods, limitations of simulational physics.</p> <p>CO2: Enumerate and explain Monte Carlo Method, Random walk on one, two and three dimensional lattices, self-avoiding walk, micro-canonical ensemble, canonical ensemble, classical ideal gas, ising model, grand canonical ensemble.</p> <p>CO3: Explain and understand Molecular Dynamics.</p> <p>CO4: Develop an understanding of symbolic computing systems.</p> <p>CO5: Explain and understand computing hardware basics: memory and CPU, components.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

## Ph.D. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-606– Advanced Optoelectronics</b>” describe general understanding of basic principles of advance optoelectronics and related devices applications.</p> <p>CO1: Develop an understanding of electron-hole recombination process and band gap engineering in optical materials.</p> <p>CO2: Enumerate and explain principle of laser actions: spontaneous and stimulated emission and absorption, the condition for the laser action.</p> <p>CO3: Explain and understand working of semiconductor injection laser: efficiency, stripe geometry LED materials, commercial LED materials.</p> <p>CO4: Develop an understanding of basic electronic devices: p-n junction their application in solar cells and light emitting diodes, optical communications, fundamental principles of photonics and light-matter interactions.</p> <p>CO5: Explain and understand about waveguides switches and modulators and other devices of integrated optics.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-610– Advanced Materials and Energy Devices</b>” Describe general understanding of advanced materials and their applications including energy devices.</p> <p>CO1: Develop an understanding of theories and physical mechanisms of advanced materials, concept of Fermi-energy, work function and electron affinity.</p> <p>CO2: Enumerate and explain interaction between materials of different chemical origin; organic and inorganic species; motifs and functions, bio-functional structure, carbon based materials such as ACs, graphene, CNTs, MWNTs.</p> <p>CO3: Explain and understand concept of energy production and storage; Emerging trends in LEDs and optoelectronic devices; Electrochemical capacitors and supercapacitors.</p> <p>CO4: Develop an understanding of magneto-hydrodynamics and magnetic fluids; rechargeable batteries; solar batteries and solar charger; solar cells etc.</p> <p>CO5: Develop an understanding of hydrogen production techniques and storage using hybrid materials, hydride batteries and fuel cells.</p>
<b>Credits</b>	03 Theory and 01 Tutorial periods of one hour per week over a semester

## Ph.D. (Physics) Program

### Program Outcomes, Program Specific Outcomes, Course Outcomes

<b>Course Outcomes</b>	<p>COs of the course “<b>PHY-609– Research Methodology</b>” Describe general understanding of some basic concepts of research and its methodologies.</p> <p>CO1: Develop an understanding of need, importance and impact of research, types of research, research process.</p> <p>CO2: Learn about synopsis writing, selecting research problem; formulation of research projects; survey of literature.</p> <p>CO3: Develop an understanding of formulation and types of hypothesis; collection, maintenance, storage and analysis of data.</p> <p>CO4: Understand compilation and presentation of results, writing of manuscripts; research reports and thesis.</p> <p>CO5: Know about various funding agencies provides financial support for research and writing research proposal for external funding.</p> <p>CO6: Develop an understanding of computer and informatics including word processing, excel, power point presentation etc.</p> <p>CO7: Explain and understand principal and working procedure of various lab instruments.</p> <p>CO8: Able to writing a review article on topic of interest</p>
<b>Credits</b>	03 Theory periods of one hour per week over a semester

## **Programme: Ph. D (Zoology)**

### **PROGRAMME OUTCOMES (POs)**

**PO 1:** Gain a thorough grounding in the fundamentals in different areas of Zoology such as ecology, biodiversity, entomology, developmental biology, applied zoology etc.

**PO 2:** Develop the skill of applying concepts and techniques used in animal sciences.

**PO 3:** Apply ethical principles in animal behaviour, wild life conservation etc.

**PO 4:** Effectively aware the society about human wildlife conflict.

**PO 5:** Develop an attitude to perform effectively and efficiently as a leader as well as a member of a team in a sustainable development.

**PO 6:** Ability to engage in lifelong learning.

**PO 7:** To integrate knowledge, skill and attitude that will sustain an environment of learning and creativity among the students.

**PO 8:** Exposure about museums, zoos, national parks, sanctuaries, apiary, diary, vermicomposts units and laboratories.

**PO 9:** Enabling students to be capable of making decisions at personal and professional level.

**PO 10:** Getting prepared for post graduate studies and other competitive exams in order to achieve success in their professional careers.

### **PROGRAMME SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** Students will be able to develop, demonstrate and disseminate the knowledge and skills to laymen about climate change, pollution, communicable diseases and biodiversity.

**PSO 2:** Students also acquire skills to work as animal trainers, animals care takers, conservationists, lab technicians, zookeeper, wildlife biologists and many more.

**PSO 3:** Students will be able to play roles of animal breeder, forensic experts, lab technicians etc. which will help learners to possess knowledge and other soft skills and to react aptly when confronted with critical or unethical decision making.

**PSO 4:** Students will learn modern techniques such as composite culture such as pisciculture, aquaculture, sericulture, lac culture, oyster culture etc. applying these skills in their future careers in Zoology and other applied fields.

**PSO 5:** Students will be able to develop and demonstrate knowledge of applied zoology in integrated farming system for sustainable development.



**PSO 6:** Students will gain thorough systematic and subject skills within various disciplines of entomology, parasitology, embryology, physiology, ecology and applied zoology (apairy, diary, vermiculture etc.).

**PSO 7:** Learners will be able to recognize the role of zoologist, animals and wild life educators, veterinarian, entomologist, parasitologist etc. which will help learners to possess knowledge and other soft skills.

**PSO 8:** Learners will acquire the skills like effective communication, decision - making, problem solving in day to day life affairs.

**PSO 9:** Learners will involve in various co-curricular activities to demonstrate relevancy of foundational and theoretical knowledge of their academic major and to gain practical exposures therein.

**PSO 10:** Apart from theoretical knowledge learners can also acquire practical skills to work as zoo keeper, wildlife educators, animal trainers, veterinarian and various sectors such as healthcare centres, Pharmaceutical companies, pathology labs, medical camps academic institutions etc.

Course	Course outcomes (COs)
	<b>Ph. D Zoology</b>
<b>Research Methodology (ZOO-609)</b>	<p><b>CO 1:</b> To equip the students about history, myths and ethnic practices and research process.</p> <p><b>CO 2:</b> To know about how to write synopsis of research projects etc.</p> <p><b>CO 3:</b> To know the importance of computer and informatics in research.</p> <p><b>CO 4:</b> Students should be aware about the current status and future prospects of research</p>
<b>Tools and Techniques for Research in Zoology (ZOO-606)</b>	<p><b>CO 1:</b> Students will be get knowledge about microscopy, its principle &amp; applications along with the other techniques used in biochemistry and Microbiology.</p> <p><b>CO 2:</b> Students will get knowledge about Chromatography, Electrophoresis their principle type and applications. Radioisotopes and main isotope techniques in biology.</p>

	<p><b>CO 3:</b> Students will learn about histological techniques: Principles of tissue fixation, microtomy, staining, mounting and other parameters used in histochemistry.</p> <p><b>CO 4:</b> Students will study various cell culture techniques: Culture media, essential components and Preparation, Cell viability testing and Polymerase chain reaction (PCR).</p>
<b>Advances in Parasitology (ZOO-601)</b>	<p><b>CO 1:</b> Students will understand Pathogenesis due to protozoans and helminth parasites (animal and plant- parasitic nematodes). Basis of host cell parasite interactions with special reference to autoimmune response and pathogenesis of protozoan diseases in general.</p> <p><b>CO 2:</b> Students will learn how to prepare in vitro culture of protozoan and helminth parasites in the laboratory.</p> <p><b>CO 3:</b> Students will examine ecobiology of egg and larval forms in helminth parasites along with egg hatching mechanisms in these parasites.</p> <p><b>CO 4:</b> It will also help the students to understand the effect of parasitism on the host and reaction of host in response to these parasites.</p>
<b>Advanced topics in Entomology (ZOO-602)</b>	<p><b>CO 1:</b> To equip the students about insect pheromones and allelochemicals.</p> <p><b>CO 2:</b> This course will felicitate the students about insect toxicology Bio-chemistry and behavioural Physiology.</p> <p><b>CO 3:</b> Students will learn about type of nervous system, signal transmission and Diapause found in insects.</p> <p><b>CO 4:</b> Students will learn about eco-friendly pest control systems such as Biological control and Integrated Pest Management (IPM) etc.</p>
<b>Special topics in Biochemistry ((ZOO-603)</b>	<p><b>CO 1:</b> Understanding of covalent properties of proteins.</p> <p><b>CO 2:</b> Proper understanding of protein structure and their folding.</p> <p><b>CO 3:</b> Students will learn about enzyme kinetics.</p> <p><b>CO 4:</b> Students will understand the importance of molecular biology and medical biochemistry.</p>
<b>Advanced topics in Cytogenetic and Molecular</b>	<p><b>CO 1:</b> Learners can acquire knowledge on structural genomics: genome sequencing, Chromosome maps, Physical Mapping of Genomes and use of genome maps in genetics analysis.</p>

<b>Genetics (ZOO-604)</b>	<p><b>CO 2:</b> Learners can learn various cytogenetic techniques used in molecular biology.</p> <p><b>CO 3:</b> Understanding of molecular tools used in biology.</p> <p><b>CO 4:</b> Students will be able to understand evolutionary genetics and its role in modern context</p>
<b>Advanced topics in Physiology (605)</b>	<p><b>CO 1:</b> Students will be able to understand stem cells and their role in myogenesis.</p> <p><b>CO 2:</b> Understanding the concept of metabolic fuels and effects of exercise, training on muscle metabolism, anapleurosis in muscle, muscle glutamine and oxidative stress.</p> <p><b>CO 3:</b> Students will learn basics of smooth muscle excitation and contraction.</p> <p><b>CO 4:</b> Students will understand calcium dependent activation of contractile machinery in vertebrate smooth muscle.</p>

## Department of Microbiology, Akal College of Basic Sciences

### B.Sc. (Hons.) Microbiology (Three Year Degree Programme)

<b>Program Objectives</b>	<ol style="list-style-type: none"><li>1. To impart in-depth understanding of various aspects of microbiology and to prepare the students for a successful career in basic and applied areas of microbiology in academics/higher education, medical research, biological research, public health, scientific writing, environmental organizations and biopharmaceutical industries, diagnostic labs, quality control, food production, healthcare sector, bioinformatics and biotechnology.</li><li>2. Prepare the learners to understand, analyse and solve real-life problems based on the knowledge of microbial sciences with the ultimate goal of creating informed citizens exhibiting professionalism, ethical attitude, sensitivity towards societal issues and excellent communication skills.</li></ol>
<b>Program Outcomes</b>	<ol style="list-style-type: none"><li>1. Students of this programme will learn and explore an array of subjects covering basic microbiology such as Bacteriology, Virology, Microbial Metabolism, Immunology, Cell Biology, Molecular Biology, Biochemistry and Environmental Science. Learners will get aware of applied microbiology fields viz. Industrial Microbiology, Food and Dairy Microbiology, Environmental Microbiology and Medical &amp; Diagnostic Microbiology, Vaccination, Industrial Microbiology and Bioprocess &amp; Microbial Technology.</li><li>2. The learners will be able to apply the knowledge of microbiology acquired during this program to solve various problems related to human health, sustainable agricultural development, food production, human nutrition, waste management and biocontrol.</li><li>3. Learners will be able to plan, perform, analyze and interpret the experimental data for exploring various problems in microbiology and its sub-disciplines.</li></ol>
<b>Program Specific Outcomes</b>	<ol style="list-style-type: none"><li>1. On completion of this program, learners will be able to understand the basic and applied concepts of microbiology viz. biochemistry, cell biology, biotechnology, bioinformatics, biostatistics, infections, microbial diseases, industrial fermentation, biodegradation, bioremediation, food &amp; dairy microbiology, plant pathology, soil microbiology, microbial ecology, biofertilizers and system biology.</li><li>2. Learners will develop independent thinking and competence to carry out microbiological testing, quality control, microbial production, biopharmaceutical production, epidemiological work, diagnostic assays, research work, phylogenetic analysis, academic jobs and administrative responsibilities at various levels.</li></ol>

#### Course Specific Outcomes

On completion of a specific course, the learners will be able to:

<b>General Microbiology</b>	Understand the contributions of eminent scientists in the field of microbiology, various groups of microbial cells viz. bacteria, archaea, algae, fungi, protozoa, protists, viruses, prions; prokaryotic vs eukaryotic cells and microbial classification.
<b>Bacteriology</b>	Learn about bacterial cells, organelles, bacterial phyla, important genera/species and importance of bacteria in health, food, environment and industries.

<b>Virology</b>	Learn the structure and life cycle of viruses, nomenclature & classification, cultivation & detection methods and viral diseases of humans, animals and plants.
<b>Microbial Metabolism</b>	Understand the mechanism, process and types of metabolic pathways occurring in microbial cells related to ATP generation, respiration, fermentation, photosynthesis, anabolism, catabolism, enzyme kinetics, bioenergetics and DNA metabolism.
<b>Immunology</b>	Understand the structure, function and roles/applications of immune system, antigens, immunoglobulins, APCs, humoral & cellular immunity, MHC molecules, TCR, BCR, CD4, CD8, monoclonal antibodies, transplantation, complement system, hypersensitivities, immunodeficiencies, cancer, autoimmune disorders and vaccines.
<b>Environmental Microbiology</b>	Learn the concepts of biodegradation, bioremediation, wastewater treatment, solid waste treatment, bio-composting, biomining, biogeochemical cycles and symbiosis.
<b>Food Microbiology</b>	Acquire knowledge of types of foods, importance of microbes in food production, fermented foods, food spoilages, Pasteurization, preservation methods, food infections, food intoxication, MAP, HACCP, food certification, water quality analysis, coliforms, aseptic packaging and public health.
<b>Industrial Microbiology</b>	Understand the scope of industrial microbiology, strain improvement, commercial production of alcoholic beverages, dairy products, bakery products, vitamins, colours, flavouring agents, antibiotics, steroids, microbial enzymes, bioethanol, biofuels, bioplastics, microbial construction materials, polysaccharides, upstream & downstream processing, Lyophilization, intellectual property rights and patents.
<b>Fermentation &amp; bioprocess Technology</b>	Understand fermentations processes, design & types of bioreactors/fermenters, downstream processing, product separation techniques, microbial growth characteristics, biofactories, bio-refinery and animal cell culture.
<b>Medical Microbiology</b>	Learn about the normal microbiota, pathogenic microbes, infectious diseases, pandemic, epidemic, pathogenesis, laboratory diagnosis, blood culture systems, antibiotics, antimicrobial agents, drug susceptibility testing, biopharmaceuticals, disease transmission, public health, ESKAPE, NTDs and drug resistance.
<b>Molecular Biology</b>	Understand structure & functions of DNA, RNA, proteins; replication, transcription, translation, PTMs, cloning vectors, gene libraries, recombinant DNA, gene regulation, PCR, blotting techniques, DNA fingerprinting, genetic engineering, GMOs and recombinant products.



## Department of Microbiology, Akal College of Basic Sciences

### M.Sc. Microbiology

(Two Year Degree Programme)

<b>Program Objectives</b>	<ol style="list-style-type: none"><li>1. Demonstrate an ability to understand the potential of basic and applied microbiology in addressing the problems of society and public health.</li><li>2. Attain eligibility, skills and competency to pursue career in higher educational institutions, R&amp;D laboratories, medical research, biological research, scientific writing, industries, diagnostic labs, quality control labs and food production houses.</li><li>3. Identify entrepreneurship potential of interdisciplinary microbiological &amp; biotechnological education and their implementation to create job potential for others.</li><li>4. Inculcate continuous learning, work culture and professional ethics to adapt in a team and as a team leader in challenging and responsible position of education and research.</li></ol>
<b>Program Outcomes</b>	On completion of M.Sc. Microbiology programme, students will be able to apply the knowledge of microbiology and interdisciplinary allied sciences to understand the microbial life processes & interactions <i>in vitro</i> and <i>in vivo</i> and their impact on environment & human life. Learners will be able to identify the research problems, search research literature, use appropriate research methodology, statistical analysis and data interpretation to apply reasoning obtained through the contextual knowledge to assess impact of microorganisms on the society, environment and public health. Learners will be able to apply ethical principles and professional ethics at position of responsibilities and to work effectively as an individual, and as a team member or team leader in multidisciplinary academic and research settings.
<b>Program Specific Outcomes</b>	<ol style="list-style-type: none"><li>1. At the end of M.Sc. Microbiology programme, learners will be able to understand the applications and importance of Environmental Microbiology, Industrial Microbiology, Food Microbiology, Medical Microbiology, Immunology, Agricultural Microbiology, Microbial Biotechnology and Biochemistry.</li><li>2. Learners will be able to design and perform experiments and execute a short research project incorporating techniques of basic and advanced microbiology.</li><li>3. Learners will demonstrate competent skills in handling various instruments, following standard microbial practices and safety guidelines at work places.</li><li>4. Learners will develop independent thinking and competence to carry out microbiological testing, quality control, microbial production, biopharmaceutical production, epidemiological work, diagnostic assays, research work, phylogenetic analysis, academic jobs and administrative responsibilities at various levels.</li></ol>

#### Course Specific Outcomes

On completion of a specific course, the learners will be able to:

<b>General Microbiology</b>	Understand the contributions of eminent scientists in the field of microbiology, various groups of microbial cells viz. bacteria, archaea, algae, fungi, protozoa, protists, viruses, prions; prokaryotic vs eukaryotic cells and microbial classification.
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<b>Microbial Metabolism</b>	Understand the mechanism, process and types of metabolic pathways occurring in microbial cells related to ATP generation, respiration, fermentation, photosynthesis, anabolism, catabolism, enzyme kinetics, bioenergetics and DNA metabolism.
<b>Immunology</b>	Understand the structure, function and roles/applications of immune system, antigens, antibodies, APCs, humoral & cellular immunity, tissue transplantation, complement system, hypersensitivities, immunodeficiencies and autoimmune disorders.
<b>Environmental Microbiology</b>	Learn the concepts of biodegradation, bioremediation, wastewater treatment, solid waste treatment, bio-composting, biomining, biogeochemical cycles and symbiosis.
<b>Food &amp; Dairy Microbiology</b>	Acquire knowledge of types of foods, importance of microbes in food production, dairy fermented foods, food spoilages, Pasteurization, preservation methods, food infections, food intoxication, MAP, HACCP, food certification, water quality analysis, coliforms, aseptic packaging and public health.
<b>Industrial Microbiology &amp; Fermentation Technology</b>	Understand the scope of industrial microbiology, strain improvement, IPRs, design & types of bioreactors/fermenters, commercial production of alcoholic beverages, dairy products, bakery products, vitamins, colours, flavouring agents, antibiotics, steroids, microbial enzymes, bioethanol, biofuels, bioplastics, microbial construction materials, polysaccharides and upstream & downstream processing.
<b>Medical &amp; Diagnostic Microbiology</b>	Understand about normal microbiota, pathogenic microbes, infectious diseases, pandemic, epidemic, pathogenesis, laboratory diagnosis, blood culture systems, antibiotics, antimicrobials, MIC testing, biopharmaceuticals, disease transmission, public health, ESKAPE, NTDs and drug resistance.
<b>Molecular Biology</b>	Understand about DNA, RNA, proteins, replication, transcription, translation, PTMs, cloning vectors, gene libraries, recombinant DNA, gene regulation, PCR, blotting techniques, DNA fingerprinting, genetic engineering, GMOs and recombinant products.
<b>Biostatistics</b>	Learn the basic knowledge of probability, distributions, means, standard deviation, correlation, skewness, kurtosis, testing of goodness of fit by applying chi square and t- test, ANOVA and statistical software packages.
<b>Computation Biology &amp; Bioinformatics</b>	Understand computer hardware & software, networking protocols, multimedia applications, information technology, bioinformatics tools, biological databases, softwares for sequence alignment, phylogenetic analysis and data interpretation.
<b>Research Methodology</b>	Acquire knowledge research problem, objectives of research, experimental design, data collection, data analysis & interpretation, hypothesis testing procedures, ethics in research, plagiarism, scientific writing, thesis submission and scientific publishing, peer-review process.
<b>Dissertation</b>	Acquire ability to identify the research topic, design objectives, utilize journals & e-resources for literature survey, technical skills in carrying out experiments, operation of sophisticated analytical instruments, data collection, analysis & interpretation, competent scientific writing, effective communication & presentation skills and thesis writing & submission.

## Department of Microbiology, Akal College of Basic Sciences

### Ph.D. Microbiology (Research Programme)

<b>Program Outcomes</b>	On completion of M.Sc. Microbiology programme, students will be able to apply the knowledge of microbiology and interdisciplinary allied sciences to understand the microbial life processes & interactions <i>in vitro</i> and <i>in vivo</i> and their impact on environment & human life. Learners will be able to identify the research problems, search research literature, use appropriate research methodology, statistical analysis and data interpretation to apply reasoning obtained through the contextual knowledge to assess impact of microorganisms on the society, environment and public health. Learners will be able to apply ethical principles and professional ethics at position of responsibilities and to work effectively as an individual, and as a team member or team leader in multidisciplinary academic and research settings.
<b>Program Specific Outcomes</b>	Research students will be able to understand the applications and importance of basic and applied microbiology disciplines. They will be able to independently design and execute experimental work towards completion of specific research problem for doctoral degree. Learners will demonstrate competent skills in handling various instruments, following standard microbial practices and safety guidelines at work places. Competence, learning and independent thinking will allow learners to carry out microbiological testing, quality control, microbial production, biopharmaceutical production, epidemiological work, diagnostic assays, phylogenetic analysis, research work and administrative work in their further academic profession and industrial job assignments.

<b>Course Specific Outcomes</b> On completion of a specific course, the learners will be able to:	
<b>Research Methodology</b>	Acquire knowledge research problem, objectives of research, experimental design, data collection, data analysis & interpretation, hypothesis testing procedures, ethics in research, plagiarism, scientific writing, thesis submission and scientific publishing, peer-review process.
<b>Thesis work</b>	Acquire ability to identify the research topic, design objectives, utilize journals & e-resources for literature survey, technical skills in carrying out experiments, operation of sophisticated analytical instruments, data collection, analysis & interpretation, competent scientific writing, effective communication & presentation skills and thesis writing & submission.







<b>Name of the College (Department)</b>		<b>Akal College of Basic Sciences (Department of Mathematics)</b>										
<b>Name of the program</b>		<b>B.Sc. (Hons. with Research) Physical Sciences</b>										
<b>Course Code</b>												
<b>Course Title</b>		<b>Introduction to R Programming</b>										
<b>Academic Year</b>		I										
<b>Semester</b>		I										
<b>Number of Credits</b>		3										
<b>Course Prerequisite</b>		This course is intended for students with no prior programming experience.										
<b>Course Synopsis</b>		This course provides an introduction to the R programming language, focusing on data analysis, visualization, and statistical computing. Students will learn the fundamentals of R, including data manipulation, data visualization, and basic statistical analysis.										
<b>Course Outcomes:</b>												
<b>CO1</b>	Understand the basics of R programming language.											
<b>CO2</b>	Perform data manipulation and cleaning.											
<b>CO3</b>	Create various types of data visualizations.											
<b>CO4</b>	Conduct basic statistical analyses.											
<b>CO5</b>	Write efficient R scripts for data analysis.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs) &amp; Program Specific Outcomes :</b>												
COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1		1	1	1	2		2		2	3	2	3
CO2			2	1	2		2		2	3	2	3
CO3		2	2	1	2		2		2	3	2	3
CO4		2	2	1	2		2		2	3	2	3
CO5			1	1	2		2		2	3	2	3
<b>Average</b>												
1= Weak Correlation			2 = Moderate Correlation					3 = Strong Correlation				



<b>Name of the College (Department)</b>		<b>Akal College of Basic Sciences (Department of Physics)</b>										
<b>Name of the Programme</b>		<b>B.Sc. (Hons. with Research) Physical Sciences</b>										
<b>Course Code</b>												
<b>Course Title</b>		<b>Nanoscience and Its Applications</b>										
<b>Academic Year</b>		<b>I</b>										
<b>Semester</b>		<b>II</b>										
<b>Number of Credits</b>		<b>3</b>										
<b>Course Prerequisite</b>		<b>-</b>										
<b>Course Synopsis</b>		The aim of this course is to impart knowledge to the students about nanoscience and its applications. Further, utilization of the same for sustainable future.										
<b>Course Outcomes:</b> At the end of the course students will be able to:												
<b>CO1</b>	Explain about emergence & challenges of nanoscience and nanotechnology; understand size & surface effect at nanoscale on the properties.											
<b>CO2</b>	Describe the various synthesis and characterization techniques of nanomaterials.											
<b>CO3</b>	Understand and explain various types & properties on nanomaterials.											
<b>CO4</b>	Explain the role of nanotechnology in agriculture and food processing.											
<b>CO5</b>	Describe the diverse applications of nanotechnology for sustainable energy and environment.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs) &amp; Program Specific Outcomes:</b>												
<b>COs</b>	<b>PO1</b>	<b>PO2</b>	<b>PO3</b>	<b>PO4</b>	<b>PO5</b>	<b>PO6</b>	<b>PO7</b>	<b>PSO1</b>	<b>PSO2</b>	<b>PSO3</b>	<b>PSO4</b>	<b>PSO5</b>
<b>CO1</b>	3	1	1	1	1	2	1	1	2	1	1	1
<b>CO2</b>	1	1	2	2	1	1	2	1.5	2	2	1.5	2
<b>CO3</b>	2	2	1.5	1	2	1.5	1	1	2	1	1	2
<b>CO4</b>	2	1	1	1	1	1	1	1.5	2	1.5	1.5	1.4
<b>CO5</b>	3	1	0.5	2	2	2.5	2	2	2	1	1	1
<b>Avg.</b>	<b>2.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.4</b>	<b>1.4</b>	<b>1.6</b>	<b>1.4</b>	<b>1.2</b>	<b>2</b>	<b>1.4</b>	<b>1.2</b>	<b>0.8</b>
1= Weak Correlation				2 = Moderate Correlation					3 = Strong Correlation			





<b>Name of the College (Department)</b>		Akal College of Basic Sciences (Department of Chemistry and Biochemistry)										
<b>Name of the Program</b>		B.Sc. (Hons. with Research) Physical Sciences / B.Sc. Life Sciences (Hons. with Research)										
<b>Course Code</b>		SEC-2 Chemistry										
<b>Course Title</b>		Chemistry of Cosmetics and Hygiene Product										
<b>Academic Year</b>		I										
<b>Semester</b>		II										
<b>Number of Credits</b>		1+1 = 2										
<b>Course Prerequisite</b>												
<b>Course Synopsis</b>		Cosmetics play a significant role in our daily lives, enhancing individuals' appearances, bolstering their self-esteem and confidence. Given the vast global opportunities in the cosmetic industry, this course aims to introduce B.Sc. students to the realm of cosmetic chemistry. It's designed to provide theoretical and practical insights into the fundamental principles, manufacturing processes, and formulation techniques involved in creating various cosmetic products.										
<b>Course Outcomes:</b> At the end of the course students will be able to:												
<b>CO1</b>	Define cosmetic term, types of cosmetic product, and explain the scope of cosmetic chemistry.											
<b>CO2</b>	Understand chemistry of perfumes.											
<b>CO3</b>	Understand the basic of cosmetics, various cosmetic formulation, ingredients and their roles in cosmetic products.											
<b>CO4</b>	Learn the use of safe, economic and body-friendly cosmetics											
<b>CO5</b>	Prepare new innovative formulations.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	1	2	1	1	2	1	1	1
CO2	1	1	2	2	1	1	2	1.5	2	2	1.5	2
CO3	2	2	1.5	1	2	1.5	1	1	2	1	1	2
CO4	2	1	1	1	1	1	1	1.5	2	1.5	1.5	1.4
CO5	3	1	0.5	2	2	2.5	2	2	2	1	1	1
<b>Average</b>	<b>2.2</b>	<b>1.2</b>	<b>1.2</b>	<b>1.4</b>	<b>1.4</b>	<b>1.6</b>	<b>1.4</b>	<b>1.2</b>	<b>2</b>	<b>1.4</b>	<b>1.2</b>	<b>0.8</b>
1= Weak Correlation												

<b>Name of the Department</b>	Botany
<b>Name of the Program</b>	
<b>Course Code</b>	0310025011
<b>Course Title</b>	Environmental Sciences-I
<b>Academic Year</b>	2024-25
<b>Semester</b>	II



<b>Number of Credits</b>	2											
<b>Course Prerequisite</b>												
<b>Course Synopsis</b>	The Environmental Sciences includes a multidisciplinary approach to comprehend the contemporary environmental threats. The United Nations is stressing upon the sustainable development through various conferences as well as agreements to secure the future of our coming generations worldwide. It is evident that no citizen of this global village can afford to be unaware of the deteriorating state of our environment. In Indian civilization, our ancient scriptures have stressed upon cultivating the values as well as practices for environmentalconservation. In the present era, a clear understanding of environmental issues and adoptingeeco-friendly life styles has become even more important to save the mother earth. Keeping in view the points mentioned above, this course has been designed to promote awareness, skills, quality of life, avoiding overuse and sustainable use of natural resources among students.											
<b>Course Outcomes:</b> At the end of the course students will be able to:												
<b>CO1</b>	Embraceeco-friendly practices in life and promote these practices among the people in the society.											
<b>CO2</b>	Acquireextensive knowledge about natural resources as well as processes that support life.											
<b>CO3</b>	Evolve analytical thinking to formulate plans for environmental protection, natural resource conservation as well as sustainable development.											
<b>CO4</b>	Cultivate attitudes as well as valuesfor diligent involvement in resolving contemporary environmental issues andpreventing the future ones.											
<b>CO5</b>	Comprehend the consequences of human activities on the ecosystems, world economy as well as the quality of human life.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1												
CO2												
CO3												
CO4												
CO5												
<b>Average</b>												
1= Weak Correlation                      2= Moderate Correlation                      3= Strong Correlation												

**ABILITY ENHANCEMENT**

**AECC- FUNCTIONAL ENGLISH – 1**

<b>Name of the Department</b>	<b>DEPARTMENT OF ENGLISH &amp; COMMUNICATION STUDIES</b>
<b>Name of the Program</b>	
<b>Course Code</b>	<b>0220025011</b>
<b>Course Title</b>	<b>FUNCTIONAL ENGLISH – I</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	The course is suitable for students of all majors and backgrounds, with content designed to address individual learning needs and styles.
<b>Course Synopsis</b>	The "Functional English- I " course is designed to help students develop practical English language skills for everyday communication and professional settings. This course focuses on enhancing fluency, accuracy, and confidence in using English for various functional purposes, such as workplace communication, social interactions, and daily tasks. Students will engage in interactive activities, real-life simulations, and hands-on practice to build the foundational skills necessary for effective communication in English-speaking environments.

<b>Course Outcomes:</b>	
At the end of the course students will be able to:	
<b>CO1</b>	To introduce corrective measures to eliminate grammatical errors in speaking and writing.
<b>CO2</b>	To learn the theoretical and conceptual understanding of the elements of grammar.
<b>CO3</b>	To enhance the learners’ ability of communicating accurately and fluently
<b>CO4</b>	To enable the learners to achieve accuracy in oral production by encouraging the use of a pronunciation dictionary (Oxford Advanced Learners’ Dictionary).

## SEC-II: Event Management

(Akai College of Economics, Commerce and Management)	
<b>Name of the Program</b>	
<b>Course Code</b>	0430024021
<b>Course Title</b>	Event Management
<b>Academic Year</b>	
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	NIL
<b>Course Synopsis</b>	To provide students with the knowledge and skills necessary to plan, organize, and execute successful events across various sectors and industries.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	Understand the need and importance of various types of events, their theme, development and design for organization.
<b>CO2</b>	To learnt the methods of preparing resource and financial requirement for the organization of event.
<b>CO3</b>	Understanding the importance of marketing, sponsorship needs, publicity, promotional methods and strategies.
<b>CO4</b>	To learn procedures of recruitment and selection of workforce for event & their education and training on safety and security issues.

## SEMESTER – II

<b>Name of the Department</b>	Hindi
<b>Name of the Program</b>	
<b>Course Code</b>	0230025011
<b>Course Title</b>	सामान्यहिंदीभाषाऔरभाषाविज्ञानं
<b>Academic Year</b>	2024-25

<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	हिंदीभाषाकेबारेमेंबुनियादीसमझहोनीचाहिए। छात्रहिंदीभाषालिखनेऔरपढ़नेमेंसक्षमहोनेचाहिए।
<b>Course Synopsis</b>	छात्रसामान्यभाषाविज्ञानऔरहिंदीभाषाकेबारेमेंसमझसकेंगे छात्रभाषाविज्ञानकेकुछहिस्सोंऔरहिंदीक्षेत्रऔरइसकीबोलियोंकेबारेमेंभीज्ञानप्राप्तकरेंगे। छात्रआदिकाल, मध्यकालऔरआधुनिककालकेबारेमेंभीज्ञानप्राप्तकरेंगे।
<b>Course Outcomes:</b> पाठ्यक्रमकेअंतमेंछात्रइसमेंसक्षमहोंगे:	
CO1	छात्र सामान्य हिंदी में पत्राचार अनुवाद, मुहावरे, लोकोक्तियाँ एवं देवनागरी लिपि के बारे में जानेंगे।
CO2	छात्र सामान्य भाषा विज्ञान और हिंदी भाषा की बुनियादी बातों के बारे में जानेंगे।
CO3	हिंदी के क्षेत्र एवं हिंदी की उपबोलियों के बारे में ज्ञान अर्जित करेंगे।
CO4	हिंदी भाषा का उदय एवं विकास जानने के बारे में विस्तार से ज्ञान अर्जित करेंगे।
CO5	आदिकाल, मध्यकाल एवं आधुनिक काल के बारे में जानने के लिए

<b>Name of the College (Department)</b>	Akal College of Health & Allied Sciences (Nursing)
<b>Name of the Program</b>	
<b>Course Code</b>	0710024021
<b>Course Title</b>	Geriatric Care
<b>Academic Year</b>	2024-2025
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	<p>The Geriatric Care Certificate Course offered by Akal College of Nursing, Eternal University, is a 2-credit skill-based program designed to provide participants with essential knowledge and practical skills in caring for the elderly. This course focuses on preparing individuals to respond effectively to geriatric needs in both personal and public settings.</p> <p>Open to individuals from diverse educational backgrounds, the course integrates theoretical knowledge with hands-on training to address key aspects of elderly care. Participants will be equipped to ensure elderly safety, prevent elder abuse, and promote healthy aging. Upon successful completion, participants will receive a certificate, empowering them to contribute meaningfully to improving the quality of life for the elderly in their communities.</p>
<b>Course Outcomes:</b> At the end of the course students will be able to:	
CO1	Develop a foundational understanding of geriatric care principles and the aging process to ensure patient safety and effective care delivery.
CO2	Provide competent assistance in daily personal care activities, promoting independence and dignity for elderly patients.
CO3	Support elderly patients in maintaining proper nutrition and hydration, including specialized feeding techniques when necessary.

<b>CO4</b>	Perform essential care tasks, including monitoring vital signs, managing wounds, administering medications, and supporting mobility, while ensuring patient comfort and safety.
<b>CO5</b>	Identify and address signs of elder abuse, ensuring the protection and dignity of patients.
<b>CO6</b>	Deliver compassionate end-of-life care, focusing on comfort, dignity, and quality of life for elderly individuals.

<b>Name of the College (Department)</b>	Akal College of Health & Allied Sciences (Nursing)
<b>Name of the Program</b>	
<b>Course Code</b>	0710024011
<b>Course Title</b>	First Aid (Basic)
<b>Academic Year</b>	2024-2025
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	The First Aid Care Provider certificate course at Akal College of Nursing, Eternal University, is a Skill Course with 2 credits designed to equip participants with essential first aid skills and knowledge for effective emergency response. Open to individuals from any educational background, the course covers both theoretical and practical aspects of first aid. Participants receive a certificate, empowering them to promote community safety, respond confidently in emergencies, and pursue further opportunities in healthcare.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	Define first aid, articulate the role and responsibilities of a first aid provider, and confidently utilize the contents of a standard first aid kit.
<b>CO2</b>	Explain the basic structure and functions of the human body relevant to first aid, and consistently apply safe practices to minimize risk during care administration.
<b>CO3</b>	Rapidly recognize and differentiate between various emergencies, implementing appropriate first aid protocols for common injuries and environmental hazards.
<b>CO4</b>	Demonstrate proper techniques for safely moving, lifting, and transporting a victim, minimizing further injury and ensuring patient comfort.
<b>CO5</b>	Adhere to universal precautions and safety protocols in all first aid situations, minimizing the risk of infection and ensuring a safe environment for both the responder and the victim.



## Punjabi as Ability Enhancement (AEC)

### AEC-1 (ਪੰਜਾਬੀਮੁੱਢਲਾਗਿਆਨ-1)

Akal College of Arts and Social Sciences	
Name of the Department	Punjabi
Name of the Program	
Course Code	0280025011
Course Title	ਪੰਜਾਬੀਮੁੱਢਲਾਗਿਆਨ-1
Academic Year	2024-25
Semester	II
Number of Credits	2
Course Prerequisite	ਵਦਿਆਰਥੀਪੰਜਾਬੀਭਾਸ਼ਾਦੀਮੁੱਢਲੀਸਿਖਿਲਾਈਪ੍ਰਾਪਤਕਰਨਪ੍ਰਤੀਇਛੁਕੋਣੇਚਾਹੀਦੇ ਹਨ।
Course Synopsis	ਇਸਕੋਰਸਦੇਅੰਤਰਗਤਵਦਿਆਰਥੀਪੰਜਾਬੀਭਾਸ਼ਾਦੀਮੁੱਢਲੀਜਾਣਕਾਰੀਤੇਜਾਣੂਹੋਣਗੇਜਿਸਦੇਅੰਤਰਗਤਉਹਪੰਜਾਬੀਭਾਸ਼ਾਦੀਆਂਧੁਨੀਆਂਅਤੇਸ਼ਬਦਾਂਦਾਬੋਲਅਤੇਲਿਖਤਅਭਿਆਸ ਕਰਨਗੇਜਿਸਦਕਾਉਹਨਾਂਅੰਦਰਇਕਨਵੀਭਾਸ਼ਾਦਾਵਕੀਅਸਹੋਵੇਗਾ।
<b>Course Outcomes:</b> At the end of the course students will be able to:	
CO1	ਵਦਿਆਰਥੀਪੰਜਾਬੀਵਰਣਮਾਲਾਦੇਉਚਾਰਨਸਬੰਧੀਜਾਣਕਾਰੀਹਾਸਲਿਕਰਨਗੇ।
CO2	ਵਦਿਆਰਥੀਪੰਜਾਬੀਵਰਣਮਾਲਾਦੇਲੇਖਣ-ਪ੍ਰਬੰਧਸਬੰਧੀਜਾਣਕਾਰੀਹਾਸਲਿਕਰਨਗੇ।
CO3	ਵਦਿਆਰਥੀਪੰਜਾਬੀਭਾਸ਼ਾਦੇਸ਼ਬਦਾਂਨੂੰਬੋਲਣਅਤੇਲਿਖਣਸਬੰਧੀਜਾਣਕਾਰੀਹਾਸਲਿਕਰਨਗੇ।
CO4	ਵਦਿਆਰਥੀਪੰਜਾਬੀਮੁਹਾਰਨੀਅਤੇਲਗਾਖੁਰਾਂਦੀਪਛਾਣਕਰਦੇਹੋਏਸਧਾਰਨਸ਼ਬਦਾਂਦਾਅਭਿਆਸਕਰਨਗੇ।

## SEMESTER – II

Name of the Department	Department of Music
Name of the Program	Skill Enhancement Course
Course Code	0250024021
Course Title	Introduction to Gurmat Sangeet (with Harmonium)- 2
Academic Year	I
Semester	II
Number of Credits	2
Course Prerequisite	The Student should have interest in learning Shabad (Gurmat Sangeet) in Raag and Reet Style.

<b>Course Synopsis</b>	This course provides knowledge to the students learning Gurmat Sangeet where they will learn basic terms of Gurmat Sangeet such as- Rahao, Ank, Ghar, Chant etc. They will learn to sing Khayal in RaagaBhairav (With Harmonium) set to Teen Taala. They will also learn to recite Shabads (With Harmonium) set to Taala Dadra and Kahrawa. The student will also learn Thah and Dugunlayakaries in the prescribed taalas.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The students will be aware of the basic terminologies of Gurmat Sangeet which will help them to properly understand the same. These terminologies are –Raag, Rahao, Ank, Ghar, Chant, Sirlekh etc.
<b>CO2</b>	The student will learn to perform KhayalRaagBhairav with proper elaborations including alaap and taan.
<b>CO3</b>	The students will learn to recite Shabads in Taala Dadra and Kahrawa.
<b>CO4</b>	They will learn to write the Thah and Dugunlayakaries of the prescribed Taalas. They will also learn these layakaries with hand beats.
<b>CO5</b>	They will learn basic concepts of Indian classical music such as laya, taal, matra, mukhra, etc.
<b>CO6</b>	They will learn to write and sing Alankaar in RaagaBilawal and Bhairav with Harmonium.

<b>Name of the Department</b>	Akal College of Engineering & Technology
<b>Name of the Program</b>	
<b>Course Code</b>	0610024021
<b>Course Title</b>	<b>Mastering Typing</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	--
<b>Course Synopsis</b>	These computer courses integrate computational skills with various fields, including biology, marketing, healthcare, engineering, arts, environment, education, and finance. Students learn tools like C/python Programming, Hardware and software, and Database to solve real-world problems, computer networks and its design systems using simulation, and create innovative solutions, bridging technology with interdisciplinary applications effectively.
<b>Course Outcomes:</b> At the end of the course students will be able to:	

<b>CO1</b>	Can easily reach typing speeds above 75-80 <u>words per minute</u>
<b>CO2</b>	Learning to touch type, and to do so accurately, can be one of the most invaluable skills of your career.
<b>CO3</b>	It presents an opportunity for students to “over learn” material and improve their skill through self-study.

#### **SKILL ENHANCEMENT COURSE**

<b>Course Code</b>	<b>Course Title</b>
SEC- II	PERSONALITY DEVELOPMENT

<b>Name of the Department</b>	<b>DEPARTMENT OF ENGLISH &amp; COMMUNICATION STUDIES</b>
<b>Name of the Program</b>	
<b>Course Code</b>	<b>0220024011</b>
<b>Course Title</b>	<b>PERSONALITY DEVELOPMENT</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	A willingness to reflect on personal habits, behaviors, and attitudes. This introspective approach is crucial for personal growth and improvement and a genuine interest in learning about oneself and developing skills that contribute to improved communication, confidence, and interpersonal relationships.
<b>Course Synopsis</b>	The "Personality Development" course is designed to help individuals understand, improve, and refine their personal and professional attributes. This course explores various aspects of personality development, including self-awareness, confidence, communication skills, leadership, and emotional intelligence. Through interactive sessions, reflective exercises, and group activities, students will learn how to enhance their personal growth and cultivate a positive, adaptable, and resilient personality.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	Build confidence and self-esteem through practical exercises and constructive feedback.
<b>CO2</b>	Strengthen emotional intelligence by exploring emotional awareness, empathy, and relationship management.
<b>CO3</b>	Cultivate leadership skills, including teamwork, decision-making, and conflict resolution.
<b>CO4</b>	Promote a growth mindset and adaptability, encouraging students to embrace change and seek continuous improvement. Emphasize the importance of ethics, integrity, and social responsibility in personal and professional life.



**SKILL ENHANCEMENT COURSEs**  
**DEPARTMENT OF PLANT PATHOLOGY**

<b>Name of the Department</b>	<b>PLANT PATHOLOGY</b>
<b>Name of the Program</b>	
<b>Course Code</b>	0170024011
<b>Course Title</b>	Mushroom cultivation
<b>Academic Year</b>	2024-25
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	<p>Mushroom production provides advantages such as being a source of nutrition, tonic, medicine, and dietary food items. Mushrooms are rich in fiber, protein, vitamins, and minerals, and can be a substitute for meat. They also have potential for employment generation and recycling agro-waste. In addition to this, it paves ways for employment generation in significant amount. The substrate remains after cultivation of mushroom is more readily digestible and palatable to livestock. Mushrooms can grow without sunlight or fertile soil; require low investment and little maintenance. Thus, many farmers are growing mushrooms on a part-time basis. Mushroom cultivation has a special relevance in India because wheat and rice straw &amp; plant residues are abundantly available. Our environment is also good for cultivation of mushrooms and the Indian mushroom industry is anticipated to be driven by farmers growing preference for mushroom farming due to its higher profitability and greater export potential. Moreover, the best thing about the cultivation of mushroom farming is, they require less space and become ready to harvest within 3 weeks of the casing (covering of compost with a thin layer of sterile soil or materials like chalk powder).</p>
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	History of Mushroom Cultivation, Present status of the mushroom industry in India
<b>CO2</b>	Food value of Mushrooms Proteins, Vitamins, Minerals, Carbohydrates and Fats, Energy value of mushrooms
<b>CO3</b>	Mushroom Culture Techniques, their Preservation and Maintenance
<b>CO4</b>	Mushroom Spawn Production Techniques
<b>CO5</b>	Economics of Mushroom Cultivation





<b>Akal College of Arts &amp; Social Sciences</b>	
<b>Value Added Course</b>	
<b>Name of the Department</b>	Department of English and Communication Studies
<b>Name of the Program</b>	
<b>Course Code</b>	
<b>Course Title</b>	<b>Culture and Communication</b>
<b>Academic Year</b>	2024-2025
<b>Semester</b>	II
<b>Number of Credits</b>	2
<b>Course Prerequisite</b>	The students are expected to have an affinity for English literature and be familiar with the area of intersection between language and culture. A basic understanding of communication theories and practices with a proficient background in prior exposure to diverse cultures is a must.
<b>Course Synopsis</b>	The course is meant to introduce the students to the interdisciplinary platform of culture and communication. The students will be able to analyze the complex structure of how culture constructs the semantics of communication with the help of myriad forms of exchanges, perspectives, and ideological transactions. It will provide a deeper understanding of the dynamic relationship between culture and communication, instilling the necessary skills to navigate intercultural interactions effectively.
<b>Course Outcomes:</b> At the end of the course, students will be able to:	
<b>CO1</b>	The students will be able to demonstrate a significant competence in intercultural communication and will be able to critically assess the role of media and technology in cultural communications.
<b>CO2</b>	The students will be able to analyze the various cultural dimensions and their profound impact on communication. They will be able to apply various communication strategies in diverse cultural contexts.
<b>CO3</b>	The students will be able to comprehend the diverse forms of cultural exchanges and familiarize themselves with the impact of globalization on these exchanges. They will also implicate the various teachings by using appropriate techniques to resolve cross-cultural conflicts.
<b>CO4</b>	The students will be prepared to navigate the complexities of cultural interactions in a globalized world and will be able to address the ethical considerations in any intercultural communication by promoting global citizenship. The student will be able to design, conduct and analyse inter cultural communication scenarios.

Name of the Department	Agronomy
Name of the Program	
Course Code	011002611
Course Title	National Cadet Corps-I
Academic Year	2024-25
Semester	II
Number of Credits	2
Course Prerequisite	
Course Synopsis	The NCC is a platform for young individuals to develop their personality, leadership skills, and sense of responsibility while contributing to the welfare of society and the nation. The NCC curriculum is designed to provide a holistic learning experience that combines military training, adventure activities, social service, leadership development, and personal growth to prepare young individuals for a successful and fulfilling life.
Course Outcomes: At the end of the course students will be able to:	
CO1	Understand the basic concept of NCC and its importance in national aspects.
CO2	Respect the diversity of different Indian culture.
CO3	Practice togetherness, teamwork and empathy in all walks of their life.
CO4	Do their own self-analysis and will work out to overcome their weakness for better performance in all aspects of life.
CO5	Critically think and analyse.

## **VAC: 2 Yoga: Philosophy and Practice**

Course title and code	Credit	Credit distribution of the course		
		L	T	P
Yoga: Philosophy and Practice	2	1	0	1

### **Learning objectives:-**

\*To learn the fundamentals of Yoga for harmonizing the body, mind and emotions.

\* To demonstrate the value and the practice of holistic living.

\*The value the heritage of yoga for self and society.

### **Learning outcomes:**

The learning outcomes of the course are:

\*Understand ways to harmonies the body and mind through yoga.

\*Discipline the mind through practicing yoga.

\*Understanding of consciousness through practical training.

## **BCA (BACHELOR IN COMPUTER APPLICATION)**

The Program outcomes in BCA are aimed at allowing flexibility and innovation in design and development of course content, in method of imparting training, in teaching learning process and in assessment procedures of the learning outcomes. The emphasis in BCA courses, in the outcome-based curriculum framework, help students learn how to solve problems, accomplish IT tasks, and express creativity, both individually and collaboratively. The proposed framework will help Students learn programming techniques and the syntax of one or more programming languages. After graduating with a 4 years degree, the students are eligible for 1 year MCA (Master in Computer Application) Programme.

### **PROGRAM OUTCOMES**

**PO1: Fundamental Knowledge:** Graduates will have a strong foundation in computer science, programming, and information technology, enabling them to understand and apply core principles in diverse areas of computing and technology.

**PO2: Problem-Solving Skills:** Graduates will be able to analyze complex problems, identify computing requirements, and design and implement effective software solutions using modern tools and techniques.

**PO3: Innovation and Research:** Graduates will be prepared to engage in innovative practices and research activities, contributing to advancements in the field of computer science and fostering a spirit of inquiry and creativity.

**PO4: Ethical and Social Responsibility:** Graduates will understand and adhere to professional ethics and responsibilities, recognizing the societal, environmental, and global impacts of their computing solutions.

**PO5: Communication and Teamwork:** Graduates will develop strong communication skills, both oral and written, and be able to work effectively in diverse teams, exhibiting leadership and collaborative abilities.

**PO6: Lifelong Learning:** Graduates will recognize the need for continuous learning and self-improvement, staying updated with emerging technologies, methodologies, and best practices in the field of computer science.

**PO7: Entrepreneurship and Employability:** Graduates will possess the knowledge and skills necessary for successful careers in the IT industry, including the potential for entrepreneurial ventures, by understanding business processes, project management, and the dynamic nature of the technology sector.

### **PROGRAMME SPECIFIC OUTCOMES (PSO)**

**PSO1:** Apply standard Software Engineering practices and strategies in real-time software project development

**PSO2:** Design and develop computer programs/computer -based systems in the areas related to AI, algorithms, networking, web design, cloud computing, IoT and data analytics

**PSO3:** Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

**PSO4:** The ability to apply the knowledge and understanding noted above to the analysis of a given information handling problem.

**PSO5:** The ability to work independently on a substantial software project and as an effective team member.



<b>Name of the College</b>	Akal College of Engineering and Technology
<b>Name of the Program</b>	BCA (Hons. with Research)
<b>Course Code</b>	0610111011
<b>Course Title</b>	Foundations of IT
<b>Academic Year</b>	2024-25
<b>Semester</b>	I
<b>Type of Course</b>	Discipline Specific Core (DSC)
<b>L+T+P</b>	3+0+2
<b>Credits</b>	4
<b>Course Prerequisites</b>	–
<b>Course Objective(s)</b>	<ol style="list-style-type: none"> <li>1. Familiarize students with the basic concepts, terminology, and components of Information Technology (IT), including hardware, software, and networking.</li> <li>2. Develop proficiency in the use of common software applications such as word processors, spreadsheets, databases, and presentation tools for solving real-world problems.</li> <li>3. Provide foundational knowledge of programming, covering basic logic, problem-solving, and an introduction to a simple programming language like HTML, CSS, JScript.</li> <li>4. Explain the basics of computer networking, including the types of networks (LAN, WAN, etc.), network protocols, and how the internet works.</li> </ol>
<b>Course Outcome</b>	<ol style="list-style-type: none"> <li>1. Define and explain basic IT terminology, components of a</li> </ol>

<b>(CO)</b>	<ol style="list-style-type: none"> <li>computer system, and the role of software and hardware in IT.</li> <li>2. Demonstrate proficiency in using common office applications (word processing, spreadsheets, presentations) to perform a variety of tasks.</li> <li>3. Describe the key components of a computer system, including the CPU, memory, storage devices, and peripherals, and understand their functions.</li> <li>4. Apply logical thinking and basic programming concepts to write and debug simple programs in an introductory programming language</li> <li>5. Explain how computer networks operate, the types of networks, and how the internet functions, including an understanding of IP addresses, DNS, and common network protocols.</li> </ol>
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**Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes:**

[illegible]

<b>Name of the College</b>	Akal College of Engineering and Technology
<b>Name of the Program</b>	<b>BCA (Hons. with Research)</b>
<b>Course Code</b>	<b>0610111021</b>
<b>Course Title</b>	<b>C Programming</b>
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Type of Course</b>	Discipline Specific Core (DSC)
<b>L+T+P</b>	3+0+2
<b>Credits</b>	4
<b>Course Prerequisites</b>	–
<b>Course Objective(s)</b>	<ol style="list-style-type: none"> <li>1. To introduce students to the basic concepts and structure of the C programming language, including data types, operators, and expressions.</li> <li>2. To enable students to apply logical thinking and systematic approaches to solve problems through programming in C.</li> <li>3. To familiarize students with control structures such as loops, conditional statements, and branching, and their application in real-world programming problems.</li> <li>4. To teach students the concept of modular programming by dividing complex problems into functions and developing programs with reusable code.</li> </ol>
<b>Course Outcome (CO)</b>	<ol style="list-style-type: none"> <li>1. Explain the Core Concepts of C Programming</li> <li>2. Develop Efficient Programs Using Control Structures</li> <li>3. Implement Functions and Modular Programs</li> <li>4. Manipulate Arrays and Pointers Effectively</li> </ol>

**Mapping of Course Outcomes (COs) to Program Outcomes (POs) & Program Specific Outcomes:**

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	2	1	3	1	2	1	3	1	3	3	1
CO2	2	3	2	1	1	1	2	1	3	2	2	3
CO3	3	1	2	2	1	3	1	3	1	1	1	3
CO4	2	1	3	2	1	3	1	2	2	2	2	1
Avg.	2.5	1.75	2	2	1	2.25	1.25	2.25	1.75	2	2	2

1: Weak Correlation, 2: Moderate Correlation; 3: Strong Correlation

























# BACHELOR OF TECHNOLOGY IN COMPUTER SCIENCE AND ENGINEERING

## 4. Programme Educational Objectives

**PEO1:** To produce students employable towards building a successful career based on sound understanding of theoretical and applied aspects as well as methodology to solve multidisciplinary real-life problems.

**PEO2:** To produce professional graduates ready to work with a sense of responsibility, ethics and enabling them to work efficiently individually and also as a team.

**PEO3:** To impart the competency in students so that they are able to pursue higher studies and research in areas of engineering and other professionally related fields.

**PEO4:** To inculcate ability to adapt to the changing technology through continuous

## 5. Programme Outcomes (POs)

Engineering Graduates will be able to:

**PO1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

**PO2. Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

**PO3. Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

**PO4. Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions for complex problems.

**PO5. Modern tool usage:** Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

**PO6. The engineer and society:** Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

**PO7. Environment and sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

**PO8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

**PO9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

**PO10. Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

#### **6. Programme Specific Outcomes (PSOs)**

In addition to these twelve POs, three Programme Specific Outcomes (PSOs) are formulated

**PSO1:** Ability to analyze, design, implement, and test software systems based on requirement specifications and development methodologies of software systems.

**PSO2:** Apply computer science theory blended with engineering mathematics to solve computational tasks and model real world problems using appropriate programming language, data structure, and algorithms.

**PSO3:** Ability to explore technological advancements in various domains, evaluate its merits and identify research gaps to provide solution to new ideas and innovations.

**Course Code: MATH101**

**L-T-P: 3-1-0**

**Credit: 4**

**Course Title: Mathematics for Computer Science**

#### **Objectives:**

1. Develop Analytical and Problem-Solving Skills
2. Understand Fundamental Mathematical Concepts and Theories
3. Apply Mathematical Techniques to Engineering Problems
4. Learn Mathematical Modelling and Simulation
5. Enhance Computational Skills for Engineering Applications

#### **Course Outcomes:**

Upon successful completion of the course, the student will be able to:

1. Understand and analyze the theoretical & practical aspects of matrices and calculus.
2. Solve systems of linear equations using multiple methods, demonstrate understanding of linear independence, and determine eigenvalues and eigenvectors and solve eigenvalue problems.
3. Understand the various solution techniques and practical aspects of differential and Integral calculus.
4. Apply the concepts of matrices and calculus in various engineering problems.



**Course Code: CSE101**

**L-T-P: 3-0-2**

**Credit:4**

**Course Title: C Programming**

**Objectives:**

1. Grasp the foundational components and functions of computer systems.
2. Learn the syntax, constructs, and principles of the C programming language.
3. Cultivate the ability to analyze problems and design solutions using C.
4. Practice writing, compiling, and executing C programs to reinforce learning.
5. Understand memory allocation, pointers, and memory manipulation in C for efficient programming.

**Course Outcomes:**

After completing this course satisfactorily, a student will be able to:

1. Confidently operate computers to carry out computational tasks.
2. Understand the working of Hardware and Software and the importance of operating systems.
3. Understand programming languages, number systems, peripheral devices, networking, multimedia and internet concepts.
4. Read, understand and trace the execution of programs written in C language.
5. Write the C code for a given problem.
6. Perform input and output operations using programs in C.
7. Write programs that perform operations on arrays, strings, structures, unions and functions.

**Course Code: PHY101**

**L-T-P: 3-0-2**

**Credit: 3**

**Course Title: Engineering Physics**

**Objectives:**

1. Develop a solid understanding of fundamental principles in physics for engineering applications.
2. Enhance analytical and critical thinking abilities to solve complex engineering problems.
3. Gain practical experience in designing, conducting, and interpreting experiments.
4. Apply physics concepts to various engineering disciplines to innovate and improve technology.
5. Prepare for advanced study and research in engineering physics.

**Course Outcomes:**

Upon successful completion of the course, the student will be able to

1. Describe the optical devices and their applications.
2. Identify the applications of electrodynamics using Maxwell equations.
3. Apply the concept of semiconductor physics to understand electronic systems.
4. Apply concepts of Quantum mechanics in solving physics problems at nanoscale.
5. Analyze the materials based on their magnetic behavior and discover the various properties and applications of superconductivity.
6. Discover the synthesis and properties of nanomaterials.

**Course Code: EEE101**

**LTP: 3-0-2**

**Credit: 4**

**Course Title: Fundamentals of Electrical and Electronics Engineering**

**Objectives**

1. This course aims to equip the students with a basic understanding of Electrical circuits and machines for specific types of applications.
2. The course gives a comprehensive exposure to house wiring.
3. This course also equips students with an ability to understand basic analog and digital electronics.

**Outcomes**

1. The students shall develop an intuitive understanding of circuit analysis,
2. basic concepts of electrical machines,
3. house wiring and basics of electronics and be able to apply them in practical situations.

**Course Code: EVS301**

**L-T-P: 3-0-0**

**Credit: 3**

**Course Title: Environmental Science**

**Objectives:**

1. Understanding Ecosystems and Biodiversity
2. Comprehending Environmental Pollution and Control Measures
3. Learning Sustainable Development and Resource Management
4. Awareness of Environmental Policies and Legislation
5. Developing Skills for Environmental Impact Assessment and Management

**Course Outcomes:**

1. Understanding of concepts and methods: Ecological and Physical Sciences and their application in Environmental problem solving.
2. Understanding of the transnational character of Environmental problems and ways of addressing them, including interactions across local to global scales. Applying system concepts and methodologies to analyze and understand interactions between social and environmental processes.
3. Reflecting critically about the roles and identities as citizens, consumers and environmental actors in a complex interconnected world.
4. An interdisciplinary approach to complex environmental problems using basic tools of the natural and social sciences including ecosystems, biology, chemistry, economics, political science and international processes.
5. The ability to work effectively as a member of an interdisciplinary team on complex problems involving multiple competing stakeholders and agenda. It will also help in developing the ability to write effectively about complex environmental problems and do so for both specialist and general audiences with equal facility.

**Course Code: THU101**

**L-T-P: 2-0-2**

**Credit: 3**

**Course Title: Communication Skills**

**Objectives:**

1. Understand the principles of effective communication in professional settings, including verbal, non-verbal, and written communication.
2. Develop proficiency in conveying ideas, information, and messages clearly, concisely, and appropriately in diverse workplace scenarios.
3. Cultivate interpersonal skills necessary for building and maintaining professional relationships, including teamwork, collaboration, and conflict resolution.
4. Explore the role of technology and digital platforms in modern professional communication and develop proficiency in utilizing them effectively.

**Course Outcomes:**

Some of the course learning outcomes that students of this course are required to demonstrate runs thus:

1. To improve the communicative competence of the students.
2. To enable the students to converse in their life situations.
3. To train the students to use English for practical purposes.
4. To enable the students to acquire phonetic skills required for oral skills.



**Course Code: MATH102**

**L-T-P: 3-1-0**

**Credit: 4**

**Course Title: Probability and Statistics**

**Objectives:**

1. To introduce the fundamental concepts relevant to Ordinary & Partial Differential Equations, Transform Theory.
2. To able to form and solve the ordinary & partial differential equation using different analytical techniques Learn Mathematical Modelling and Simulation
3. Enhance Computational Skills for Engineering Applications
4. To gain knowledge of Scalars and Vectors.

**Course Outcomes:**

Upon successful completion of the course, the student will be able to-

1. To understand the theory of matrices for solving linear system of algebraic equations, eigenvalue problems and its application to system of ordinary differential equations.
2. To attain knowledge of the concepts of partial differentiation, maxima and minima, power series expansion of function of several variables.
3. To understand and apply the knowledge of double and triple integrals for evaluation of area, surface area and volume.
4. To analyze the physical interpretation of gradient, divergence and curl of various scalar and vector fields.
5. To understand the basics of vector integration and theorems related to line, surface and volume integrals.
6. To solve linear, non-linear, homogeneous, non-homogeneous partial differential equations which arise in many branches of science and engineering.

**Course Code: CSE103**

**L-T-P: 3-0-4**

**Credit: 5**

**Course Title: Introduction to Python**

**Objectives**

1. Enhance the knowledge on basic principles of python.
2. Enhance the knowledge on functions and strings in python.
3. Acquire the knowledge on data structures in python.
4. Enable students to write simple object-oriented programming in python.
5. Understand the exception handling and modules.

**Course Outcomes**

1. Understanding the knowledge on basic principles of python.
2. Apply the functions and strings in python.
3. Analyze the data structures in python.
4. Analyze the data structures in python.
5. Apply simple object-oriented programming in python.
6. Analyze the data handling and modules.



**Course Code: CSE104**

**LTP: 3-0-0**

**Credit: 3**

**Course Title: Discrete Structure**

**Objectives**

1. Understand fundamental concepts in discrete mathematics.
2. Apply discrete mathematical principles to problem-solving in computer science and related fields.
3. Develop logical reasoning and proof-writing skills.
4. Gain proficiency in discrete structures such as sets, relations, functions, and graphs.
5. Explore combinatorial techniques for counting and enumeration.
6. Study basic principles of formal logic and propositional calculus.
7. Introduce principles of probability theory and its applications in discrete scenarios.
8. Understand the significance of discrete mathematics in cryptography, algorithms, and computer science theory.

**Course Outcomes:**

1. Employing the basics of logics, set theory, functions and relations to solve real life mathematical problems.
2. Solve different mathematical problems using the concept of POSETs and Lattices.
3. Analyze different real life graphs problems and implement various solutions to solve them.
4. Evaluate algebraic structures to prove many mathematical problems.

**Course Code: CSE105**

**LTP: 3-0-4**

**Credit: 5**

**Course Title: Digital Circuits and Logic Design**

**Objectives**

1. Introduce students to the fundamental concepts of digital electronics, including binary number systems, Boolean algebra, logic gates, and basic digital circuit components.
2. Teach students how to design and analyze combinational logic circuits using Boolean algebra and truth tables. This includes the design of logic gates, multiplexers, decoders, encoders, and other combinational circuits.
3. Cover sequential logic circuits, including flip-flops, registers, counters, and sequential state machines. Students should learn how to design and analyze sequential circuits using state diagrams, state tables, and timing diagrams.

**Course Outcomes:**

1. Analyze the combinational systems using standard gates and minimization methods such as Boolean algebra, Karnaugh maps.
2. Design, simulate, built and debug combinational circuits based on an abstract functional specification.
3. Apply and design of various sequential circuits viz. Registers and Counters using flip-flops.
4. Understand Asynchronous Sequential Logic, programmable logic devices and different types of ROM.

**Course Code: HUM102**

**L-T-P: 3-0-0**

**Credit: 3**

**Course Title: Indian Constitutional Values**

**Objectives:**

To enable the students to apply the knowledge of Mathematics in various engineering fields by making them to learn the following:

1. Understand the theme of management and its organizational significance.
2. Identify general and task environmental factors.
3. Analyze organizational adaptation to environmental changes.
4. Develop and execute organizational plans.
5. Organize vertical structures and coordinate horizontally.
6. Understand citizenship, fundamental rights, and duties.
7. Examine the roles of executive, legislature, and judiciary.

**Course Outcomes:**

After completing this course students will be able to

1. Assess the business environment that will influence the management of the organizations.
2. Establish most effective actions in specific contexts while maintaining ethical standards.
3. Execute different management functions individually as well as a team player under challenging circumstances.
4. Infuse core constitutional values.

**Course Code: EDU101**

**LTP: 3-0-0**

**Credit: 3**

**Course Title: Human Values and Professional Ethics**

**Objectives:**

1. To help the students appreciate the essential complementary between 'VALUES' and 'SKILLS' to ensure sustained happiness and prosperity, which are the core aspirations of all human beings.
2. To facilitate the development of a Holistic perspective among students towards life and profession as well as towards happiness and prosperity based on a correct understanding of the Human reality and the rest of Existence. Such a holistic perspective forms the basis of Universal Human Values and movement towards value-based living in a natural way.
3. To highlight plausible implications of such a Holistic understanding in terms of ethical human conduct, trustful and mutually fulfilling human behavior and mutually enriching interaction with Nature.

**Course Outcomes:**

1. Enhanced ethical awareness and decision-making skills.
2. Cultivation of integrity and respect for diversity.
3. Recognition of social responsibility and professionalism.
4. Development of conflict resolution and leadership abilities.
5. Commitment to continuous learning and ethical behavior in professional contexts

## Program Outcomes, Program Specific Outcomes & Course Outcomes of B.Sc. IT Program

<b>POs of B.Sc. IT Program</b>	
<b>Programme Outcomes</b>	<p>PO-1: To develop the necessary analytical abilities for developing computer-based solutions for real life problems.</p> <p>PO-2: To inculcate quality practices in Information Technology solutions development.</p> <p>PO-3: To imbibe professional skills in students for their future roles.</p> <p>PO-4: To prepare necessary knowledge base for potential research and development in Information Technology.</p> <p>PO-5: To help students' build-up a successful career in Information Technology and allied fields.</p>
<b>PSOs of B.Sc. IT Program</b>	
<b>Programme Specific Outcomes</b>	<p>PSO-1: Communicate effectively with a range of audiences using a range of modalities including written, oral and graphical.</p> <p>PSO-2: Apply the knowledge of engineering and management principles to manage projects effectively in diverse environments as a member or a leader in the team.</p> <p>PSO-3: Engage in independent and life-long learning for continued professional development.</p>

<b>Course</b>	<b>Course Outcomes (Cos)</b>
<b>B.Sc. IT 1<sup>ST</sup> SEM</b>	
<b>Business Communication Professional Skills (HUM101)</b>	<ol style="list-style-type: none"> <li>1. To improve the students' accuracy and fluency in English through a well-developed vocabulary, and enable them to listen to English spoken at normal conversational speed by educated English</li> <li>2. To enable students face competitive exams such as, GRE, TOEFL, IELTS, UPSC and other Bank examinations</li> <li>3. To enable them communicate their ideas relevantly and coherently in writing</li> <li>4. Students will also exhibit advanced skills of interview, debating and discussion</li> </ol>
<b>Web Design Using HTML (COMP-201)</b>	<ol style="list-style-type: none"> <li>1. Students will be ready to discover how does web works really, what makes web sites work.</li> <li>2. Simple and impressive design techniques, from basics till advanced to focus on goal oriented and user centric designs.</li> <li>3. How to and where to start research, planning for website &amp; actually build excellent web sites.</li> </ol>

	<ol style="list-style-type: none"> <li>4. To create web elements using various tags like buttons, text boxes, checkboxes etc.</li> <li>5. Forms and validations for your website.</li> <li>6. Setting up page layout, color schemes, contrast in the designs.</li> <li>7. Writing valid and concise html code for webpages.</li> </ol>
<b>Introduction to Computer Applications (COMP-101)</b>	<ol style="list-style-type: none"> <li>1. Bridge the fundamental concepts of computers with the present level of knowledge of the students.</li> <li>2. Familiarise operating systems, programming languages, peripheral devices, networking, multimedia and internet.</li> <li>3. Understand binary, hexadecimal and octal number systems and their arithmetic.</li> <li>4. Understand how logic circuits and Boolean algebra forms as the basics of digital computer</li> </ol>
<b>English Literacy and Typewriting Awareness (ENG-105)</b>	<ol style="list-style-type: none"> <li>1. Establish correct posture and fingering at the keyboard and to improve keyboard memorisation</li> <li>2. Develop good proofreading abilities, detect all errors, and acquire a critical attitude towards spelling, punctuation, syllabification, and syntax</li> <li>3. Students can listen to and understand spoken text well and respond or apply the information appropriately with comments and/or questions.</li> <li>4. Students should be able to write cohesion and cohesiveness in writing Essays, Letters and other Literature.</li> </ol>
<b>Business Organization and Management (BC-103)</b>	<ol style="list-style-type: none"> <li>1. Understand the concepts related to Business.</li> <li>2. Demonstrate the roles, skills and functions of management.</li> <li>3. Analyze effective application of PPM knowledge to diagnose and solve organizational problems and develop optimal managerial decisions using IT Tools.</li> <li>4. Understand the complexities associated with management of human resources in the organizations and integrate the learning in handling these complexities also In IT organizations.</li> </ol>
<b>B.Sc. IT 2ND SEM</b>	
<b>Human Values and Professional Ethics (EDU101)</b>	<ol style="list-style-type: none"> <li>1. Students develop the capability of shaping themselves into outstanding personalities, through a value-based life.</li> <li>2. Students turn themselves into champions of their lives.</li> <li>3. Students take things positively, convert everything into happiness and contribute for the happiness of others.</li> <li>4. Students become potential sources for contributing to the development of the society around them and institutions / organisations they work in.</li> <li>5. Students shape themselves into valuable professionals, follow professional ethics and are able to solve their ethical dilemmas.</li> </ol>



<b>Environmental Studies (EVS301)</b>	<ol style="list-style-type: none"> <li>1. Appreciate the ethical, cross-cultural, and historical context of environmental issues and the links between human and natural systems.</li> <li>2. Understand the transnational character of environmental problems and ways of addressing them, including interactions across local to global scales.</li> <li>3. Apply systems concepts and methodologies to analyze and understand interactions between social and environmental processes.</li> <li>4. Reflect critically about their roles and identities as citizens, consumers and environmental actors in a complex, interconnected world.</li> <li>5. Demonstrate proficiency in quantitative methods, qualitative analysis, critical thinking, and written and oral communication needed to conduct high-level work as interdisciplinary scholars and/or practitioners.</li> </ol>
<b>Digital Electronics (ETE206)</b>	<ol style="list-style-type: none"> <li>1. Understand the concepts of various components to design stable analog circuits.</li> <li>2. Represent numbers and perform arithmetic operations.</li> <li>3. Minimize the Boolean expression using Boolean algebra and design it using logic gates.</li> <li>4. Analyze and design combinational circuit</li> <li>5. Design and develop sequential circuits.</li> <li>6. Translate real world problems into digital logic formulations using VHDL.</li> </ol>
<b>Problem Solving &amp; Programming C Language (COMP-121)</b>	<ol style="list-style-type: none"> <li>1. Illustrate the flowchart and design algorithm for a given problem and to develop IC programs using operators</li> <li>2. Develop conditional and iterative statements to write C programs</li> <li>3. Exercise user defined functions to solve real time problems</li> <li>4. Inscribe C programs that use Pointers to access arrays, strings and functions.</li> <li>5. Exercise user defined data types including structures and unions to solve problems</li> <li>6. Inscribe C programs using pointers and to allocate memory using dynamic memory management functions.</li> <li>7. Exercise files concept to show input and output of files in C.</li> </ol>
<b>Introduction to Information System (CSE107)</b>	<ol style="list-style-type: none"> <li>1. Analyze web information sources for relevance and accuracy; and synthesize, evaluate and communicate the results, demonstrating writing competencies at the college level.</li> <li>2. Describe the general characteristics of a computer system and identify types of computer hardware and software and explain their functions.</li> <li>3. Demonstrate the use of a word processor, spreadsheet, and database application program by completing projects that require students to extend course content to real-world</li> </ol>



	situations and manage and organize files and use data storage devices.
<b>B.Sc. IT 3RD SEM</b>	
<b>Computer Graphics (CSE204)</b>	<ol style="list-style-type: none"> <li>1. To list the basic concepts used in computer graphics.</li> <li>2. To implement various algorithms to scan, convert the basic geometrical primitives, transformations, Area filling, clipping.</li> <li>3. To describe the importance of viewing and projections.</li> <li>4. To define the fundamentals of animation, virtual reality and its related technologies.</li> <li>5. To understand a typical graphics pipeline</li> <li>6. To design an application with the principles of virtual reality</li> </ol>
<b>Software Engineering (CSE205)</b>	<ol style="list-style-type: none"> <li>1. Define various software application domains and remember different process model used in software development.</li> <li>2. Explain needs for software specifications also they can classify different types of software requirements and their gathering techniques.</li> <li>3. Convert the requirements model into the design model</li> <li>4. and demonstrate use of software and user-interface design principles.</li> <li>5. Distinguish among SCM and SQA and can classify different testing strategies and tactics and compare them.</li> <li>6. Justify role of SDLC in Software Project Development and they can evaluate importance of Software Engineering in PLC.</li> </ol>
<b>Operating Systems (CSE211)</b>	<ol style="list-style-type: none"> <li>1. Describe the important computer system resources and the role of operating system in their management policies and algorithms.</li> <li>2. Understand the process management policies and scheduling of processes by CPU</li> <li>3. Evaluate the requirement for process synchronization and coordination handled by operating system.</li> <li>4. Describe and analyze the memory management and its allocation policies.</li> <li>5. Identify use and evaluate the storage management policies with respect to different storage management technologies.</li> </ol>
<b>Computer Programming in C++ (CSE102)</b>	<ol style="list-style-type: none"> <li>1. Understand the Object oriented programming fundamentals</li> <li>2. Develop ability to design algorithms and use functions, strings and pointers</li> <li>3. Write computer programs to solve practical engineering problems</li> <li>4. Design efficient computer programs to solve practical engineering problems</li> </ol>
<b>B.Sc. IT 4TH SEM</b>	

<b>Emerging Technologies (COMP-321)</b>	<ol style="list-style-type: none"> <li>1. Identify and analyze various emerging technologies.</li> <li>2. Identify and analyze various factors that affect business strategy with emerging technologies.</li> <li>3. Understand the impact of emerging technologies in a global context.</li> <li>4. Understand the impact of emerging technologies on society as a whole</li> </ol>
<b>Core PHP (COMP-221)</b>	<ol style="list-style-type: none"> <li>1. Write PHP code to produce outcomes and solve problems.</li> <li>2. Display and insert data using PHP and MySQL.</li> <li>3. Test, debug, and deploy web pages containing PHP and MySQL.</li> </ol>
<b>System Analysis &amp; Design (CSE215)</b>	<ol style="list-style-type: none"> <li>1. Define and describe the five phases of the system development life cycle.</li> <li>2. State at least five expected benefits from systems projects.</li> <li>3. Explain at least three ways in which information systems support business requirements.</li> <li>4. Describe how systems analysts interact with users, management, and other information systems professionals.</li> <li>5. Develop data flow diagrams and decision tables.</li> </ol>
<b>Workshop on E-Accounting and E-filing of Returns (BC209)</b>	<ol style="list-style-type: none"> <li>1. Student must become familiar with the mechanism for conducting business transactions through electronic means.</li> </ol>
<b>Multimedia Technologies (CSE312)</b>	<ol style="list-style-type: none"> <li>1. Describe different realisations of multimedia tools and the way in which they are used.</li> <li>2. Analyse the structure of the tools in the light of low-level constraints imposed by the adoption of various QoS schemes (i.e bottom up approach)</li> <li>3. Identify and describe the function of the general skill sets in the multimedia industry.</li> <li>4. Identify the basic components of a multimedia project.</li> <li>5. Identify the basic hardware and software requirements for multimedia development and playback.</li> </ol>
<b>B.Sc. IT 5TH SEM</b>	
<b>Computer Networks (CSE301)</b>	<ol style="list-style-type: none"> <li>1. Students will be able to implement the terminology and concepts of the OSI reference model and the TCP-IP reference model.</li> <li>2. To master the concepts of protocols, network interfaces, and design/performance issues in local area networks and wide area networks.</li> <li>3. To be familiar with wireless networking concepts.</li> <li>4. To be familiar with contemporary issues in networking technologies.</li> <li>5. To be familiar with network tools and network programming</li> </ol>

<b>Essential of E-Commerce (BC304)</b>	<ol style="list-style-type: none"> <li>1. Explain various aspects of E-Commerce.</li> <li>2. Understand the dynamics of fourth channel</li> <li>3. Appreciate the internet technology and its infrastructure.</li> <li>4. Understand the methodology for online business dealings using E-Commerce infrastructure</li> </ol>
<b>Data Structure (CSE201)</b>	<ol style="list-style-type: none"> <li>1. Student will be able to choose appropriate data structure as applied to specified problem definition.</li> <li>2. Student will be able to handle operations like searching, insertion, deletion, traversing mechanism etc. on various data structures.</li> <li>3. Students will be able to apply concepts learned in various domains like DBMS, compiler construction etc.</li> <li>4. Students will be able to use linear and non-linear data structures.</li> </ol>
<b>Microprocessors &amp; Its Applications (ETE301)</b>	<ol style="list-style-type: none"> <li>1. Students will be able to program a microcontroller to perform various tasks.</li> <li>2. An ability to interface a microcontroller to various devices.</li> <li>3. An ability to effectively utilize microcontroller peripherals.</li> <li>4. An ability to design and implement a microcontroller-based embedded system.</li> <li>5. Introduction to the Architecture and programming of the microprocessor 8085.</li> </ol>
<b>Java Programming (CSE304)</b>	<ol style="list-style-type: none"> <li>1. To gain knowledge of the structure and model of the Java programming language.</li> <li>2. Students will be able to use the Java programming language for various programming technologies.</li> <li>3. To develop software in the Java programming language.</li> <li>4. Students will evaluate user requirements for software functionality required to decide whether the Java programming language can meet user requirements.</li> <li>5. To propose the use of certain technologies by implementing them in the Java programming language to solve the given problem.</li> </ol>
<b>Visual Basics Programming (CSE318)</b>	<ol style="list-style-type: none"> <li>1. Demonstrate knowledge of programming terminology and how applied using Visual Basic (e.g., variables, selection statements, repetition statements, etc.)</li> <li>2. Develop a Graphical User Interface (GUI) based on problem description</li> <li>3. Develop an Event Planning Chart based on problem description so as to define the processing that is to occur based on specific events</li> <li>4. Develop an Algorithm to verify processing is accurate</li> <li>5. Develop programs that retrieve input from a file as opposed to input only provided by user</li> </ol>
<b>B.Sc. IT 6TH SEM</b>	

<b>Next Generation Technologies (CSE218)</b>	<ol style="list-style-type: none"> <li>1. Purpose and implement a network which is capable of handling very high data rate especially multimedia data providing qos and backward compatible with old networks.</li> </ol>
<b>Database Management System (CSE213)</b>	<ol style="list-style-type: none"> <li>1. Master the basic concepts and appreciate the applications of database systems.</li> <li>2. Master the basics of SQL and construct queries using SQL.</li> <li>3. Be familiar with a commercial relational database system (Oracle) by writing SQL using the system</li> <li>4. Be familiar with the relational database theory, and be able to write relational algebra expressions for queries</li> </ol>
<b>Cryptography &amp; Internet Security (CSE314)</b>	<ol style="list-style-type: none"> <li>1. This course builds on the overview about information security, which includes an overview of public and secret key cryptosystems.</li> <li>2. Students will be able to comprehend and apply authentication services and mechanisms.</li> <li>3. Students will be able to apply the knowledge and skills obtained to study further concepts in information security</li> </ol>
<b>Computer Architecture (CSE214)</b>	<ol style="list-style-type: none"> <li>1. Students will study basic computer organization, design and micro-operations.</li> <li>2. Understanding of CPU functioning and computer arithmetic.</li> <li>3. Learning various methods and techniques of memory organization</li> <li>4. Ability to design memory organization that uses banks for different word size operations.</li> <li>5. Ability to understand the concept of I/O organization.</li> </ol>
<b>Artificial Intelligence (CSE305)</b>	<ol style="list-style-type: none"> <li>1. Students will be able to identify problems that are amenable to solution by AI methods, and which AI methods may be suited to solving a given problem.</li> <li>2. Formalise a given problem in the language/framework of different AI methods (e.g., as a search problem, as a constraint satisfaction problem, as a planning problem, etc).</li> <li>3. Implement basic AI algorithms (e.g., standard search or constraint propagation algorithms).</li> <li>4. Design and perform an empirical evaluation of different algorithms on a problem formalization, and state the conclusions that the evaluation supports.</li> </ol>

<b>COURSE</b>	<b>Course Outcome (Cos)</b>
<b>B.Sc. (N) I YEAR- I SEMESTER</b>	
<b>COMMUNICATIVE ENGLISH</b>  <b>ENGL 101</b>	<p>CO 1: Identify the significance of Communicative English for healthcare professionals.</p> <p>CO 2: Apply the concepts and principles of English Language use in professional development such as pronunciation, vocabulary, grammar, paraphrasing, voice modulation, Spelling, pause and silence.</p> <p>CO 3: Demonstrate attentive listening in different hypothetical situations.</p> <p>CO 4: Converse effectively, appropriately and timely within the given context and the individual or team they are communicating with either face to face or by other means.</p> <p>CO 5: Read, interpret and comprehend content in text, flow sheet, framework, figures, tables, reports, anecdotes etc.</p> <p>CO 6: Analyse the situation and apply critical thinking strategies.</p> <p>CO 7: Enhance expressions through writing skills.</p> <p>CO 8: Apply LSRW (Listening, Speaking, Reading and Writing) Skill in combination to learn, teach, educate and share information, ideas and results.</p>
<b>APPLIED ANATOMY</b>  <b>ANAT 105</b>	<p>CO 1: Describe anatomical terms.</p> <p>CO 2: Explain the general and microscopic structure of each system of the body.</p> <p>CO 3: Identify relative positions of the major body organs as well as their general anatomic locations.</p> <p>CO 4: Explore the effect of alterations in structure.</p> <p>CO 5: Apply knowledge of anatomic structures to analyze clinical situations and therapeutic applications.</p>
<b>APPLIED PHYSIOLOGY</b>  <b>PHYS 110</b>	<p>CO 1: Develop understanding of the normal functioning of various organ systems of the body.</p> <p>CO 2: Identify the relative contribution of each organ system towards maintenance of homeostasis.</p> <p>CO 3: Describe the effect of alterations in functions.</p> <p>CO 4: Apply knowledge of physiological basis to analyze clinical situations and therapeutic applications.</p>
<b>APPLIED SOCIOLOGY</b>	<p>CO 1: Identify the scope and significance of sociology in nursing.</p> <p>CO 2: Apply the knowledge of social structure and different culture in a</p>



<p>SOCI 115</p>	<p>society in identifying social needs of sick clients.</p> <p>CO 3: Identify the impact of culture on health and illness.</p> <p>CO 4: Develop understanding about types of family, marriage and its legislation.</p> <p>CO 5: Identify different types of caste, class, social change and its influence on health and health practices.</p> <p>CO 6: Develop understanding about social organization and disorganization and social problems in India.</p> <p>CO 7: Integrate the knowledge of clinical sociology and its uses in crisis intervention.</p>
<p><b>APPLIED PSYCHOLOGY</b></p> <p>PSYC 120</p>	<p>CO 1: Identify the importance of psychology in individual and professional life.</p> <p>CO 2: Develop understanding of the biological and psychological basis of human behaviour.</p> <p>CO 3: Identify the role of nurse in promoting mental health and dealing with altered personality.</p> <p>CO 4: Perform the role of nurses applicable to the psychology of different age groups.</p> <p>CO 5: Identify the cognitive and affective needs of clients.</p> <p>CO 6: Integrate the principles of motivation and emotion in performing the role of nurse in caring for emotionally sick client.</p> <p>CO 7: Demonstrate basic understanding of psychological assessment and nurse's role.</p> <p>CO 8: Apply the knowledge of soft skills in workplace and society.</p> <p>CO 9: Apply the knowledge of self-empowerment in workplace, society and personal life.</p>
<p><b>NURSING FOUNDATION – I (Theory)</b></p> <p>N-NF (I) 125</p>	<p>CO 1: Develop understanding about the concept of health, illness and scope of nursing within health care services.</p> <p>CO 2: Apply values, code of ethics and professional conduct in professional life.</p> <p>CO 3: Apply the principles and methods of effective communication in establishing communication links with patients, families and other health team members.</p> <p>CO 4: Develop skill in recording and reporting.</p> <p>CO 5: Demonstrate competency in monitoring and documenting vital signs.</p> <p>Co 6: Describe the fundamental principles and techniques of infection control and biomedical waste management.</p>

	<p>CO 7: Identify and meet the comfort needs of the patients.</p> <p>CO 8: Perform admission, transfer, and discharge of a patient under supervision applying the knowledge.</p> <p>CO 9: Demonstrate understanding and application of knowledge in caring for patients with restricted mobility.</p> <p>CO 10: Perform first aid measures during emergencies.</p> <p>CO 11: Identify the educational needs of patients and demonstrate basic skills of patient education.</p>
<b>NURSING FOUNDATION -I (Practicum)</b>	<p>CO 1: Maintain effective human relations (projecting professional image)</p> <p>CO 2: Communicate effectively with patient, families and team members</p> <p>CO 3: Demonstrate skills in techniques of recording and reporting</p> <p>CO 4: Demonstrate skill in monitoring vital signs</p> <p>CO5: Care for patients with altered vital signs</p> <p>CO 6: Demonstrate skill in implementing standard precautions and use of PPE</p> <p>CO 7: Demonstrate skill in meeting the comfort needs of the patients</p> <p>CO 8: Provide safe and clean environment</p> <p>CO 9: Demonstrate skill in admission, transfer, and discharge of a patient</p> <p>CO 10: Demonstrate skill in caring for patients with restricted mobility</p> <p>CO 11: Plan and provide appropriate health teaching following the principles</p> <p>CO 12: Acquire skills in assessing and performing First Aid during emergencies.</p>
<b>B.Sc. (N) I YEAR- II SEMESTER</b>	
<b>COURSE</b>	<b>Course Outcome (Cos)</b>
<b>APPLIED BIOCHEMISTRY</b> BIOC 135	<p>CO 1: Describe the metabolism of carbohydrates and its alterations.</p> <p>CO 2: Explain the metabolism of lipids and its alterations.</p> <p>CO 3: Explain the metabolism of proteins and amino acids and its alterations.</p> <p>CO 4: Explain clinical enzymology in various disease conditions.</p> <p>CO 5: Explain acid base balance, imbalance and its clinical significance.</p> <p>CO 6: Describe the metabolism of haemoglobin and its clinical significance.</p> <p>CO 7: Explain different function tests and interpret the findings.</p>

	CO 8: Illustrate the immunochemistry.
<b>APPLIED NUTRITION AND DIETETICS</b>  NUTR 140	CO 1: Identify the importance of nutrition in health and wellness. CO 2: Apply nutrient and dietary modifications in caring patients. CO 3: Explain the principles and practices of Nutrition and Dietetics. CO 4: Identify nutritional needs of different age groups and plan a balanced diet for them. CO 5: Identify the dietary principles for different diseases. CO 6: Plan therapeutic diet for patients suffering from various disease conditions. CO 7: Prepare meals using different methods and cookery rules.
<b>NURSING FOUNDATION - II (Theory)</b>  N-NF (II) 125	CO 1: Develop understanding about fundamentals of health assessment and perform health assessment in supervised clinical settings CO 2: Demonstrate fundamental skills of assessment, planning, implementation and evaluation of nursing care using Nursing process approach in supervised clinical settings CO 3: Assess the Nutritional needs of patients and provide relevant care under supervision CO 4: Identify and meet the hygienic needs of patients CO 5: Identify and meet the elimination needs of patient CO 6: Interpret findings of specimen testing applying the knowledge of normal values CO 7: Promote oxygenation based on identified oxygenation needs of patients under supervision CO 8: Review the concept of fluid, electrolyte balance integrating the knowledge of applied physiology CO 9: Apply the knowledge of the principles, routes, effects of administration of medications in administering medication CO 10: Calculate conversions of drugs and dosages within and between systems of measurements CO 11: Demonstrate knowledge and understanding in caring for patients with altered functioning of sense organs and unconsciousness CO 12: Explain loss, death and grief CO 13: Describe sexual development and sexuality CO 14: Identify stressors and stress adaptation modes CO 15: Integrate the knowledge of culture and cultural differences in meeting the spiritual needs CO 16: Explain the introductory concepts relevant to models of health

	and illness in patient care
<b>NURSING FOUNDATION - II (Practicum)</b>	<p>CO 1: Perform health assessment of each body system</p> <p>CO 2: Develop skills in assessment, planning, implementation and evaluation of nursing care using Nursing process approach</p> <p>CO 3: Identify and meet the Nutritional needs of patients</p> <p>CO 4: Implement basic nursing techniques in meeting hygienic needs of patients</p> <p>CO 5: Plan and Implement care to meet the elimination needs of patient</p> <p>CO 6: Develop skills in instructing and collecting samples for investigation.</p> <p>CO 7: Perform simple lab tests and analyze &amp; interpret common diagnostic values</p> <p>CO 8: Identify patients with impaired oxygenation and demonstrate skill in caring for patients with impaired oxygenation</p> <p>CO 9: Identify and demonstrate skill in caring for patients with fluid, electrolyte and acid – base imbalances</p> <p>CO 10: Assess, plan, implement &amp; evaluate the basic care needs of patients with altered functioning of sense organs and unconsciousness</p> <p>CO 11: Care for terminally ill and dying patients</p>
<b>HEALTH/NURSING INFORMATICS AND TECHNOLOGY</b> HNIT 145	<p>CO 1: Develop a basic understanding of computer application in patient care and nursing practice.</p> <p>CO 2: Apply the knowledge of computer and information technology in patient care and nursing education, practice, administration and research.</p> <p>CO 3: Describe the principles of health informatics and its use in developing efficient healthcare.</p> <p>CO 4: Demonstrate the use of information system in healthcare for patient care and utilization of nursing data.</p> <p>CO 5: Demonstrate the knowledge of using Electronic Health Records (EHR) system in clinical practice.</p> <p>CO 6: Apply the knowledge of interoperability standards in clinical setting.</p> <p>CO 7: Apply the knowledge of information and communication technology in public health promotion.</p> <p>CO 8: Utilize the functionalities of Nursing Information System (NIS) system in nursing.</p> <p>CO 9: Demonstrate the skills of using data in management of health care.</p> <p>CO 10: Apply the knowledge of the principles of digital ethical and legal issues in clinical practice.</p>

	<p>CO 11: Utilize evidence-based practices in informatics and technology for providing quality patient care.</p> <p>CO 12: Update and utilize evidence-based practices in nursing education, administration, and practice.</p>
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<b>COURSE OUTCOME III SEMESTER</b>	
<b>COURSE</b>	<b>COURSE OUTCOME</b>
<b>APPLIED MICROBIOLOGY</b>	<p>CO1: Explain concepts and principles of microbiology and its importance in nursing.</p> <p>CO2: Describe structure, classification morphology and growth of bacteria</p> <p>CO3: Identify Microorganisms</p> <p>CO4: Describe the different disease-producing organisms</p> <p>CO5: Explain the concepts of immunity, hypersensitivity and immunization</p>
<b>INFECTION CONTROL &amp; SAFETY</b>	<p>CO1: Summarize the evidence based and effective patient care practices for the prevention of common healthcare associated infections in the Healthcare setting</p> <p>CO2: Demonstrate appropriate use of different types of PPEs and the critical use of risk assessment</p> <p>CO3: Demonstrate the hand hygiene practice and its effectiveness on infection control</p> <p>CO4: Illustrates disinfection and sterilization in the healthcare setting</p> <p>CO5: Illustrate on what, when, how, why specimens are collected to optimize the diagnosis for treatment and management.</p> <p>CO6: Explain on BioMedical waste management &amp; laundry management</p> <p>CO7: Explain in detail about Antibiotic stewardship, AMR</p> <p>CO8: Describe MRSA/ MDRO and its prevention</p> <p>CO9: Enlist the patient safety indicators followed in a health care organization and the role of nurse in the patient safety audit process</p> <p>CO10: Captures and analyzes incidents and events for quality improvement</p> <p>CO11: Enumerate IPSG and application of the goals in the patient care settings</p> <p>CO12: Enumerate the various safety protocols and its applications</p> <p>CO13: Explain importance of employee safety indicators</p> <p>CO14: Identify risk of occupational hazards, prevention and post exposure prophylaxis.</p>



<b>PHARMACOLOGY-I</b>	<p>CO1:Describe Pharmacodynamics, Pharmacokinetics, CO2:Classification, principles of administration of drugs</p> <p>CO3:Describe antiseptics, and disinfectant &amp; nurse's responsibilities</p> <p>CO4: Describe drugs acting on gastro-intestinal system &amp; nurse's responsibilities</p> <p>CO5: Describe drugs acting on respiratory system &amp; nurse's responsibilities</p> <p>CO6: Describe drugs used on cardio-vascular system &amp; nurse's responsibilities</p> <p>CO7: Describe the drugs used in treatment of endocrine system disorders</p> <p>CO8: Describe drugs used in skin diseases &amp; nurse's responsibilities</p> <p>CO9: Explain drug therapy/chemotherapy of specific infections &amp; infestations &amp; nurse's responsibilities</p>
<b>PATHOLOGY-1</b>	<p>Define the common terms used in pathology Identify the deviations from normal to abnormal structure and functions of body system</p> <p>Explain pathological changes in disease conditions of various systems</p> <p>Describe various laboratory tests in assessment and monitoring of disease conditions</p>
<b>ADULT HEALTH NURSING - I</b>	<p>CO1: Narrate the evolution of medical surgical nursing CO2: Apply nursing process in caring for patients with medical surgical problems CO3: Execute the role of a nurse in various medical surgical setting CO4: Develop skills in assessment and care of wound CO5: Develop competency in providing pre and postoperative care CO6: Explain organizational set up of the operating theatre CO7: Differentiate the role of scrub nurse and circulating nurse CO8: Describe the different positioning for various surgeries CO9: Apply principles of asepsis in handling the sterile equipment CO10: Demonstrate skill in scrubbing procedures CO11: Demonstrate skill in assessing the patient and document accurately the surgical safety checklist CO12: Develop skill in assisting with selected surgeries CO13: Explain the types, functions, and nursing considerations for different types of anaesthesia</p>

	<p>CO14: Identify the signs and symptoms of shock and electrolyte imbalances</p> <p>CO15: Develop skills in managing fluid and electrolyte imbalances</p> <p>CO16: Perform pain assessment and plans for the nursing management</p> <p>CO17: Demonstrate skill in respiratory assessment</p> <p>CO18: Differentiates different breath sounds and lists the indications</p> <p>CO19: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of common respiratory problems</p> <p>CO20: Describe the health behaviour to be adopted in preventing respiratory illnesses</p> <p>CO21: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of gastrointestinal disorders</p> <p>CO22: Demonstrate skill in gastrointestinal assessment</p> <p>CO23: Prepare patient for upper and lower gastrointestinal investigations</p> <p>CO24: Demonstrate skill in gastric decompression, gavage, and stoma care</p> <p>CO25: Demonstrate skill in different feeding techniques</p> <p>CO26: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of cardiovascular disorders</p> <p>CO27: Demonstrate skill in cardiovascular assessment</p> <p>Prepare patient for invasive and non-invasive cardiac procedures</p> <p>CO28: Demonstrate skill in monitoring and interpreting clinical signs related to cardiac disorders</p> <p>CO29: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of hematological disorders</p> <p>CO30: Interpret blood reports</p> <p>CO31: Prepare and provide health education on blood donation</p> <p>CO32: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of endocrine disorders</p> <p>CP33: Demonstrate skill in assessment of endocrine organ dysfunction</p> <p>CO34: Prepare and provide health education on diabetic diet</p> <p>CO35: Demonstrate skill in insulin administration</p> <p>CO36: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of disorders of integumentary system</p>
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	<p>CO37: Demonstrate skill in integumentary assessment</p> <p>CO38: Demonstrate skill in medicated bath</p> <p>CO39: Prepare and provide health education on skincare</p> <p>CO40: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of musculoskeletal disorders</p> <p>CO41: Demonstrate skill in musculoskeletal assessment</p> <p>CO42: Prepare patient for radiological and non- radiological investigations of musculoskeletal system</p> <p>CO43: Demonstrate skill in crutch walking and splinting</p> <p>CO44: Demonstrate skill in care of patient with replacement surgeries</p> <p>CO45: Prepare and provide health education on bone healing</p> <p>CO46: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of patients with communicable diseases</p> <p>CO47: Demonstrate skill in barrier and reverse barrier techniques</p> <p>CO48: Demonstrate skill in execution of different isolation protocols</p>
<b>CLINICAL PRACTICUM</b>	<p>CO1: Develop skill in intravenous injection administration and IV therapy</p> <p>CO2: Assist with diagnostic procedures</p> <p>CO3: Develop skill in the management of patients with Respiratory problems</p> <p>CO4: Develop skill in managing patients with metabolic abnormality</p> <p>CO5: Develop skill in caring for patients during pre- and post- operative period</p> <p>CO6: Assist with diagnostic procedures</p> <p>CO7: Develop skill in managing patient with Gastro-intestinal Problem</p> <p>CO8: Develop skill in wound management</p> <p>CO9: Develop skill in management of patients with cardiac problems</p> <p>CO10: Develop skill in management of patients with disorders of Blood</p> <p>CO11: Develop skill in management of patients with disorders of integumentary system</p> <p>CO12: Develop skill in the management of patients requiring isolation</p> <p>CO13: Develop skill in management of patients with musculoskeletal problems</p> <p>CO14: Develop skill in caring for intraoperative patients</p>

<b>COURSE OUTCOME OF IV SEMESTER</b>	
<b>COURSE</b>	<b>COURSE OUTCOME</b>

<b>PHAMACOLOGY-II</b>	<p>CO1: Describe drugs used in disorders of ear, nose, throat and eye and nurses' responsibilities</p> <p>CO2: Describe drugs acting on urinary system &amp; nurse's responsibilities</p> <p>CO3: Describe drugs used on nervous system &amp; nurse's responsibilities</p> <p>CO4: Describe drugs used for hormonal disorder &amp; supplementation, contraception &amp; medical termination of pregnancy &amp; nurse's responsibilities</p> <p>CO5: Develop understanding about important drugs used for women before, during and after labour</p> <p>CO6: Describe drugs used in addiction, emergency, poisoning, vitamins &amp; minerals supplementation, drugs used for immunization &amp; immune-suppression &amp; nurse's responsibilities</p> <p>CO7: Demonstrate awareness of common drugs used in alternative system of medicine</p> <p>CO8: Demonstrate understanding about fundamental principles of prescribing</p>
<b>PATHOLOGY –II AND GENETICS</b>	<p>CO1: Explain pathological changes in disease conditions of various systems</p> <p>CO2: Describe the laboratory tests for examination of body cavity fluids, urine and faeces</p> <p>CO3: Explain nature, principles and perspectives of heredity</p> <p>CO4: Explain maternal, prenatal and genetic influences on development of defects and diseases</p> <p>CO5: Explain the screening methods for genetic defects and diseases in neonates and children</p> <p>CO6: Identify genetic disorders in adolescents and adults</p> <p>CO7: Describe the role of nurse in genetic services and counselling</p>
<b>ADULT HEALTH NURSING - II</b>	<p>CO1: Explain the etiology, pathophysiology, clinical manifestations, diagnostic measures and medical, surgical, nutritional and nursing management of patients with ENT disorders</p> <p>CO2: Explain the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of eye</p> <p>CO3: Describe eye donation, banking and transplantation</p> <p>CO4: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical,</p>

	<p>nutritional, and nursing management of Kidney and urinary system disorders</p> <p>CO5: Demonstrate skill in genitourinary assessment</p> <p>CO6: Prepare patient for genitourinary investigations</p> <p>CO7: Prepare and provide health education on prevention of renal calculi</p> <p>CO8: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of male reproductive disorders</p> <p>CO9: Explain the etiology, pathophysiology, clinical manifestations, types, diagnostic measures and management of patients with disorders of burns/cosmetic surgeries and its significance</p> <p>CO10: Explain the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with neurological disorders</p> <p>CO11: Explain the etiology, pathophysiology, clinical manifestations, diagnostic tests, and medical, surgical, nutritional, and nursing management of immunological disorders</p> <p>CO12: Prepare and provide health education on prevention of HIV infection and rehabilitation</p> <p>CO13: Describe the national infection control programs</p> <p>CO14: Explain the etiology, pathophysiology, types, clinical manifestations, staging, diagnostic measures and management of patients with different cancer, treatment modalities including newer treatments</p> <p>CO15: Explain the types, policies, guidelines, prevention and management of disaster and the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with acute emergencies</p> <p>CO16: Explain the Concept, physiological changes, and psychosocial problems of ageing</p> <p>CO17: Describe the nursing management of the elderly</p> <p>CO18: Explain the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients in critical care units</p> <p>CO19: Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with occupational/ industrial health disorders</p>
<b>CLINICAL PRACTICUM</b>	<p>CO1: Provide care to patients with ENT disorders</p> <p>CO2: Educate the patients and their families</p> <p>CO3: Develop skill in providing care to patients with Eye disorders</p>



	<p>CO4: Educate the patients and their families</p> <p>CO5: Develop skill in Management of patients with urinary, male reproductive problems</p> <p>CO6: Develop skill in burn assessment and providing care to patients with different types of burns</p> <p>CO7: Develop skill in providing care to patients with different types of cosmetic and reconstructive surgeries</p> <p>CO8: Develop skill in Management of patients with Neurological problems</p> <p>CO9: Develop skill in the Management of patients with immunological disorders</p> <p>CO10: Develop skill in providing care to patients with oncological disorders</p> <p>CO11: Develop skill in providing care to patients with emergency health problems</p> <p>CO12: Develops skill in geriatric assessment and providing care to patients with geriatric illness</p> <p>CO13: Develop skill in assessment of critically ill and providing care to patients with critical health conditions</p>
<b>PROFESSIONALISM, PROFESSIONAL VALUES &amp; ETHICS INCLUDING BIOETHICS</b>	<p>CO1: Discuss nursing as a profession</p> <p>CO2: Describe the concepts and attributes of professionalism</p> <p>CO3: Identify the challenges of professionalism</p> <p>CO4: Maintain respectful communication and relationship with other health team members, patients and society</p> <p>CO5: Demonstrate professional conduct</p> <p>CO6: Respect and maintain professional boundaries between patients, colleagues and society</p> <p>CO7: Describe the roles and responsibilities of regulatory bodies and professional organizations</p> <p>CO8: Discuss the importance of professional values</p> <p>CO9: Distinguish between personal values and professional values</p> <p>CO10: Demonstrate appropriate professional values in nursing practice</p> <p>CO11: Define ethics &amp; bioethics</p> <p>CO12: Explain ethical principles</p> <p>CO13: Identify ethical concerns</p> <p>CO14: Ethical issues and dilemmas in healthcare</p> <p>CO15: Explain process of ethical decision making and apply knowledge of ethics and bioethics in making ethical decisions</p> <p>CO16: Explain code of ethics stipulated by ICN and INC</p> <p>CO17: Discuss the rights of the patients and families to make decisions about healthcare</p>

B. Sc. Nursing 3 <sup>rd</sup> Year Semester V & VI	
Course	Course Outcome (COS)
<b>Child Health Nursing-I</b>	<p><b>CO 1:</b> Explain the modern concept of child care &amp; principles of child health Nursing</p> <p><b>CO 2:</b> Describe national policy programs and legislation in relation to child health and welfare</p> <p><b>CO 3:</b> Describe role of preventive pediatrics</p> <p><b>CO 4:</b> List major causes of death during infancy, early &amp; late childhood</p> <p><b>CO 5:</b> Differentiate between an adult and child in terms of illness and response</p> <p><b>CO 6:</b> Describe the major functions and role of the pediatric nurse in caring for a hospitalized child.</p> <p><b>CO 7:</b> Describe the principles of child health nursing and perform child health nursing procedures</p> <p><b>CO 8 :</b> Describe the normal growth and development of children at different ages</p> <p><b>CO 9:</b> Identify the needs of children at different ages &amp; provide parental guidance</p> <p><b>CO 10:</b> Identify the nutritional needs of children at different ages &amp; ways of meeting needs</p> <p><b>CO 11:</b> Identify the role of play for normal &amp; sick children</p> <p><b>CO 12:</b> Provide care to normal and high-risk neonates</p> <p><b>CO 13:</b> Perform neonatal resuscitation</p> <p><b>CO 14:</b> Recognize and manage common neonatal problems</p> <p><b>CO 15:</b> Apply principles and strategies of IMNCI</p> <p><b>CO 16:</b> Describe the etiology, pathophysiology, clinical manifestation and nursing management of children with disorders of respiratory, and endocrine system</p> <p><b>CO 17:</b> Develop ability to meet child-hood emergencies and perform child CPR</p>
<b>Child Health Nursing-Practical</b>	<p><b>CO 1:</b> Provide nursing care to children with various medical disorders</p> <p><b>CO 2:</b> Recognize different pediatric surgical conditions / malformations</p>

	<p><b>CO 3:</b> Provide pre and post operative care to children with common pediatric surgical conditions / malformation</p> <p><b>CO 4:</b> Counsel and educate parents</p> <p><b>CO 5:</b> Perform assessment of children - Health, Developmental and Anthropometric</p> <p><b>CO 6:</b> Perform immunization</p> <p><b>CO 7:</b> Give Health Education / Nutritional Education</p> <p><b>CO 8:</b> Provide nursing care to critically ill children</p>
<b>Child Health Nursing- Internship</b>	<p>CO 1: Provide comprehensive care to children with medical conditions</p> <p>CO 2: Provide comprehensive care to children with surgical conditions</p> <p>CO 3: Provide intensive care to neonates</p>
<b>Mental Health Nursing</b>	<p><b>CO 1:</b> Describe the historical development &amp; current trends in mental health nursing</p> <p><b>CO 2:</b> Discuss the scope of mental health nursing</p> <p><b>CO 3:</b> Describe the concept of normal &amp; abnormal behavior</p> <p><b>CO 4:</b> Discuss the scope of mental health nursing</p> <p><b>CO 5:</b> Describe the concept of normal &amp; abnormal behavior</p> <p><b>CO 6:</b> Define the various terms used in mental health nursing</p> <p><b>CO 7:</b> Explain the classification of mental disorders</p> <p><b>CO 8:</b> Explain psychodynamics of maladaptive behavior</p> <p><b>CO 9:</b> Discuss the etiological factors, psychopathology of mental disorders</p> <p><b>CO 10:</b> Explain the Principles &amp; standards of mental health nursing</p> <p><b>CO 11:</b> Describe the conceptual models of mental health nursing</p> <p><b>CO 12:</b> Describe nature, purpose &amp; process of assessment of mental health</p> <p><b>CO 13:</b> Identify therapeutic communication techniques</p> <p><b>CO 14:</b> Describe therapeutic relationship</p> <p><b>CO 15:</b> Describe therapeutic impasse and its intervention</p> <p><b>CO 16:</b> Explain treatment modalities &amp; therapies used in mental disorders and role of the nurse</p> <p><b>CO 17:</b> Describe the etiology, psychopathology, clinical manifestations, diagnostic criteria &amp; management of patients with Schizophrenia and other psychotic disorders</p>

	<p><b>CO 18:</b> Describe the etiologypsyo- pathology, clinical manifestations, diagnostic criteria andmanagement of patients with mood disorders</p> <p><b>CO 19:</b> Describe the etiology, psycho-pathology, clinical manifestations, diagnostic criteria andmanagement of patients with neurotic, stress related andSomatizationn disorders</p> <p><b>CO 20:</b> Describe the etiologypsyo-pathology, clinical manifestations, diagnostic criteria andmanagement of patients with substance use disorders</p>
<b>Mental Health Nursing- Practical</b>	<p><b>CO 1:</b> Assess patients with mental health problems</p> <p><b>CO 2:</b> Observe &amp;assist in therapies</p> <p><b>CO 3:</b> Counsel &amp; educate patient,&amp; families</p> <p><b>CO 4:</b> Assess of children with various mental health problems</p> <p><b>CO 5:</b> Counsel and educate children, families &amp; significant others</p> <p><b>CO 6:</b> Assess patients with mental health problems</p> <p><b>CO 7:</b> Provide nursing care forpatients with various mental health problems</p> <p><b>CO 8:</b> Assist invarious therapies</p> <p><b>CO 9:</b> Counsel &amp;educate patients, families &amp;significantothers</p> <p><b>CO 10:</b> Identify patients with various mentaldisorders</p> <p><b>CO 11:</b> Motivate patients for early treatment&amp; follow up</p> <p><b>CO 12:</b> Assist in follow up clinic</p>

	<p><b>CO 13:</b> Counsel and educate patient,family and community</p> <p><b>CO 14:</b> Observe the assessment and care of patients at deaddiction centre</p>
<b>Mental Health Nursing- Internship</b>	<b>CO 1:</b> Provide comprehensive care to the patient with mental health problems.
<b>Nursing Research and Statistics</b>	<p><b>CO 1:</b> Describe the conceptof research,terms, needand areas of research in Nursing</p> <p><b>CO 2:</b> Explain thesteps of research process</p> <p><b>CO 3:</b> Identify and state the research problem and objectives</p> <p><b>CO 4:</b> Review of the literature</p> <p><b>CO 5:</b> Describe the research approaches &amp; designs</p> <p><b>CO 6:</b> Explain the sampling process</p> <p><b>CO 7:</b> Describe the methods ofdata collection</p> <p><b>CO 8:</b> Analyze, interpret and summarize the research data</p> <p><b>CO 9:</b> Explain theuse of statistics, scales of measurement and graphical presentation of data</p> <p><b>CO 10:</b> Describe the measures of central tendency and variability and methods ofcorrelation.</p> <p><b>CO 11:</b> Communicate and utilize the research findings</p>
<b>Community Health Nursing - I</b>	<p><b>CO 1:</b> Define public health, community health andcommunity health nursing</p> <p><b>CO 2:</b> Explain the evolutionof public health in India and scope of community health nursing</p> <p><b>CO 3:</b> Explain various concepts of health anddisease, dimensions and determinants of health</p> <p><b>CO 4:</b> Explain the natural history of disease andlevels of prevention</p> <p><b>CO 5:</b> Discuss the health problem of India</p> <p><b>CO 6:</b> Describe health planning and its steps,and various health plans, and committees</p> <p><b>CO 7:</b> Discuss health care delivery system in India at various levels</p> <p><b>CO 8:</b> Describe SDGs, primary health careand comprehensive</p>



	<p>primary health care(CPHC)</p> <p><b>CO 9:</b> Explain health care policies and regulations in India</p> <p><b>CO 10:</b> Identify the role of an individual in the conservation of natural resources</p> <p><b>CO 11:</b> Describe ecosystem, its structure, types and functions</p> <p><b>CO 12:</b> Explain the classification, value and threats to biodiversity</p> <p><b>CO 13:</b> Enumerate the causes, effects and control measures of environmental pollution</p> <p><b>CO 14:</b> Discuss about climate change, global warming, acid rain, and ozone layer depletion</p> <p><b>CO 15:</b> Enumerate the role of an individual in creating awareness about the social issues related to environment</p> <p><b>CO 16:</b> List the Acts related to environmental protection and preservation</p> <p><b>CO 17:</b> Describe the concept of environmental health and sanitation</p> <p><b>CO 18:</b> water conservation, rain water harvesting and water shed management</p> <p><b>CO 19:</b> Describe the various nutrition assessment methods at the community level</p> <p><b>CO 20:</b> Plan and provide diet plans for all age groups including therapeutic diet</p> <p><b>CO 21:</b> Provide nutrition counseling and education to all age groups and describe the national nutrition programs</p> <p><b>CO 22:</b> Identify early the foodborne diseases, and perform initial management and referral appropriately</p> <p><b>CO 23:</b> Describe behavior change communication skills</p> <p><b>CO 24:</b> Counsel and provide health education to individuals, families and community for promotion of healthy life style practices using appropriate methods and media</p> <p><b>CO 25:</b> Describe community health nursing approaches and concepts</p> <p><b>CO 26:</b> Describe and identify the activities of community health nurse to promote and maintain family health through home visits</p> <p><b>CO 27:</b> Explain the specific activities of community health nurse in assisting individuals and groups to promote and maintain their health</p> <p><b>CO 28:</b> Provide primary care at home/ health centers(HWC) using standing orders/ protocols as per public health standards/approved by MoH&amp;FW and INC regulation</p> <p><b>CO 29:</b> Develop skill in maintenance of records and reports</p>
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<b>Clinical Practicum</b>	<p><b>CO 1:</b> Build and maintain rapport</p> <p><b>CO 2:</b> Identify the socio- demographic characteristics, health determinants and resources of a rural and an urban community</p> <p><b>CO 3:</b> Observe the functioning and document significant observations</p> <p><b>CO 4:</b> Perform nutritional assessment and plan diet plan for adult</p> <p><b>CO 5:</b> Educate individuals/ family/community on</p> <ul style="list-style-type: none"> <li>a. Nutrition</li> <li>b. Hygiene</li> <li>c. Food hygiene</li> <li>d. Healthy lifestyle</li> <li>e. Health promotion</li> </ul> <p><b>CO 6:</b> Perform health assessment for clients of various age groups</p> <p><b>CO 7:</b> Maintain records and reports</p> <p><b>CO 8:</b> Investigate epidemic of communicable disease</p> <p><b>CO 9:</b> Identify prevalent communicable and non-communicable diseases</p> <p><b>CO 10:</b> Screen, diagnose, manage and refer clients with common health problems in the community and refer high risk clients using standing orders/protocols</p> <p><b>CO 11:</b> Participate in implementation of national health programs</p>

	<b>CO 12:</b> Participate in school health program
<b>Educational Technology/ Nursing Education</b>	<p><b>CO 1:</b> Explain the definition, aims, types, approaches and scope of educational technology</p> <p><b>CO 2:</b> Compare and contrast the various educational philosophies</p> <p><b>CO 3:</b> Explain the teaching learning process, nature, characteristics and principles</p> <p><b>CO 4:</b> Identify essential qualities/attributes of a teacher</p> <p><b>CO 5:</b> Describe the teaching styles of faculty</p> <p><b>CO 6:</b> The determinants of learning and initiate self-assessment to identify own learning style</p> <p><b>CO 7:</b> Identify the factors that motivate the learner</p> <p><b>CO 8:</b> Define curriculum and classify types</p> <p><b>CO 9:</b> Identify the factors influencing curriculum development</p> <p><b>CO 10:</b> Develop skill in writing learning outcomes, and lesson plan</p> <p><b>CO 11:</b> Explain the principles and strategies of classroom management</p> <p><b>CO 12:</b> Describe different methods/strategies of teaching and develop beginning skill in using various teaching methods</p> <p><b>CO 13:</b> Explain active learning strategies and participate actively in team and collaborative learning</p> <p><b>CO 14:</b> Enumerate the factors influencing selection of clinical learning experiences</p> <p><b>CO 15:</b> Develop skill in using different clinical teaching strategies</p> <p><b>CO 16:</b> Explain the purpose, principles and steps in the use of media</p> <p><b>CO 17:</b> Categorize the different types of media and describe its advantages and disadvantages</p> <p><b>CO 18:</b> Develop skill in preparing and using media</p> <p><b>CO 19:</b> Describe the purpose, scope, principles in selection of evaluation methods and barriers to evaluation</p> <p><b>CO 20:</b> Explain the guidelines to develop assessment test</p> <p><b>CO 21:</b> Develop skill in construction of different tests</p> <p><b>CO 22:</b> Identify various clinical evaluation tools and demonstrate skill in selected tests</p> <p><b>CO 23:</b> Explain the scope, purpose and principles of guidance</p>

	<p><b>CO 24:</b> Differentiate between guidance and counseling</p> <p><b>CO 25:</b> Describe the principles, types, and counseling process</p> <p><b>CO 26:</b> Basic skill of counseling and guidance</p> <p><b>CO 27:</b> Recognize the importance of preventive counseling and develop skill to respond to disciplinary problems and grievance among students</p> <p><b>CO 28:</b> Recognize the importance of value-based education</p> <p><b>CO 29:</b> Develop skill in ethical decision making and maintain ethical standards for students</p> <p><b>CO 30:</b> Introduce knowledge of EBT and its application in nursing education</p>
<b>Introduction To Forensic Nursing And Indian Laws</b>	<p><b>CO 1:</b> Describe the nature of forensic science and discuss issues concerning violence</p> <p><b>CO 2:</b> Explain concepts of forensic nursing and scope of practice for forensic nurse</p> <p><b>CO 3:</b> Identify members of forensic team and describe role of forensic nurse</p> <p><b>CO 4:</b> Describe fundamental rights and human rights commission</p> <p><b>CO 5:</b> Explain Indian judicial system and laws</p> <p><b>CO 6:</b> Discuss the importance of POSCO Act</p>
<b>Child Health Nursing -Ii</b>	<p><b>CO 1:</b> Describe the etiology, pathophysiology, clinical manifestation and nursing management of children with disorders of cardiovascular, gastrointestinal, genitourinary, and nervous system</p> <p><b>CO 2:</b> Describe the etiology, pathophysiology, clinical manifestation and nursing management of children with Orthopedic disorders, eye, ear and skin disorders</p> <p><b>CO 3:</b> Explain the preventive measures and strategies for children with communicable diseases</p> <p><b>CO 4:</b> Describe the management of children with behavioral &amp; social problems</p> <p><b>CO 5:</b> Identify the social &amp; welfare services for challenged children</p>
<b>Mental Health Nursing-Ii</b>	<p><b>CO 1:</b> Describe the etiology, psycho-dynamics, clinical manifestations, diagnostic criteria and management of patients with substance use disorders</p> <p><b>CO 2:</b> Describe the etiology, psycho-dynamics, clinical manifestations, diagnostic criteria and management of patients with personality, and sexual disorders</p> <p><b>CO 3:</b> Describe the etiology, psycho-pathology, clinical manifestations, diagnostic criteria and management of childhood and</p>

	<p>adolescent disorders including mental deficiency</p> <p><b>CO 4:</b> Describe the etiology, psycho- pathology, clinical manifestations, diagnostic criteria and management of organic brain disorders.</p> <p><b>CO 5:</b> Identify psychiatric emergencies and carry out crisis intervention</p> <p><b>CO 6:</b> Explain legal aspects applied in mental health settings and role of the nurse</p> <p><b>CO 7:</b> Describe the model of preventive psychiatry</p> <p><b>CO 8:</b> Describe Community Mental health services and role of the nurse</p>
<b>Nursing Management And Leadership</b>	<p><b>CO 1:</b> Explore the health care, development of nursing services and education in India and trends</p> <p><b>CO 2:</b> Explain the principles and functions of management applied to nursing</p> <p><b>CO 3:</b> Describe the introductory concepts of management as a process</p> <p><b>CO 4:</b> Describe the essential elements of planning</p> <p><b>CO 5:</b> The concepts of organizing including hospital organization</p> <p><b>CO 6:</b> The significance of human resource management (HRM) and material management and discuss its elements</p> <p><b>CO 7:</b> Explain the procedural steps of material management</p> <p><b>CO 8:</b> Develop managerial skill in inventory control and actively participate in procurement process</p> <p><b>CO 9:</b> Describe the important methods of supervision and guidance</p> <p><b>CO 10:</b> Discuss the significance and changing trends of nursing leadership</p> <p><b>CO 11:</b> Analyze the different leadership styles and develop leadership competencies</p> <p><b>CO 12:</b> Explain the process of controlling and its activities</p> <p><b>CO 13:</b> Explain the concepts of organizational behavior and group dynamics</p> <p><b>CO 14:</b> Describe the financial management related to nursing services</p> <p><b>CO 15:</b> Review the concepts, principles and methods and use of nursing informatics</p> <p><b>CO 16:</b> Review personal management in terms of management of emotions, stress and resilience</p> <p><b>CO 17:</b> Describe the process of establishing educational institutions and its accreditation guidelines</p> <p><b>CO 18:</b> Explain the planning and organizing functions of a nursing</p>

	<p>college</p> <p><b>CO 19:</b> Develop understanding of staffing the college and selecting the students</p> <p><b>CO 20:</b> Analyze the leadership and management activities in an educational organization</p> <p><b>CO 21:</b> Identify various legal issues and laws relevant to nursing practice</p> <p><b>CO 22:</b> Explain various opportunities for professional advancement</p>
<b>Clinical Practicum</b>	<p><b>CO 1:</b> Prepare organizational chart of college</p> <p><b>CO 2:</b> Formulate job description for tutors</p> <p><b>CO 3:</b> Master plan, time table and clinical rotation</p> <p><b>CO 4:</b> Prepare student anecdotes</p> <p><b>CO 5:</b> Participate in planning, conducting and evaluation of clinical teaching</p> <p><b>CO 6:</b> Participate in evaluation of students' clinical experience</p> <p><b>CO 7:</b> in planning and conducting practical examination OSCE – end of posting</p>
<b>Midwifery/ Obstetrics and Gynecology (OBG) Nursing - I</b>	<p><b>CO 1:</b> Explain the history and current scenario of midwifery in India</p> <p><b>CO 2:</b> Review vital health indicator</p> <p><b>CO 3:</b> Describe the various national health programs related to RMNCH+A</p> <p><b>CO 4:</b> Identify the trends and issues in midwifery</p> <p><b>CO 5:</b> Discuss the legal and ethical issues relevant to midwifery practice</p> <p><b>CO 6:</b> Review the anatomy and physiology of human reproductive system</p> <p><b>CO 7:</b> Provide preconception care to eligible couples</p> <p><b>CO 8:</b> Describe the physiology, assessment and management of normal pregnancy</p> <p><b>CO 9:</b> Demonstrate knowledge, attitude and skills of midwifery practice throughout 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> trimesters</p> <p><b>CO 10:</b> Apply the physiology of labour in promoting normal childbirth</p> <p><b>CO 11:</b> Describe the management and care during labour</p> <p><b>CO 12:</b> Discuss how to maintain a safe environment for labour</p> <p><b>CO 13:</b> Work effectively for pain management during labour</p> <p><b>CO 14:</b> How the midwife provides care and support for the women during birth to enhance physiological birthing and promote normal birth</p> <p><b>CO 15:</b> Assess and provide care of the newborn immediately following birth</p> <p><b>CO 16:</b> Discuss the impact of labour and birth as a transitional event in the woman's life</p> <p><b>CO 17:</b> Ensure initiation of breast feeding and adequate latching</p> <p><b>CO 18:</b> Describe the physiology, management and care of normal</p>



	<p>puerperium</p> <p><b>CO 19:</b> Discuss the need for and provision of compassionate, family centered midwifery care of the newborn</p> <p><b>CO 20:</b> Describe the assessment and care of normal neonate</p> <p><b>CO 21:</b> Explain various methods of family planning and role of nurse/midwife in providing family planning services</p> <p><b>CO 22:</b> Describe youth friendly services and role of nurses/ midwives</p> <p><b>CO 23:</b> Recognize the role of nurses/midwives in gender based violence</p>
<b>Clinical Postings</b>	<p><b>CO 1:</b> Perform antenatal assessment</p> <p><b>CO 2:</b> Perform laboratory tests for antenatal women and assist in selected antenatal diagnostic procedures</p> <p><b>CO 3:</b> Counsel antenatal women</p> <p><b>CO 4:</b> Monitor labour using partograph</p> <p><b>CO 5:</b> Provide care to women during labour</p> <p><b>CO 6:</b> Conduct normal childbirth, provide care to mother and immediate care of newborn</p> <p><b>CO 7:</b> Perform postnatal assessment</p> <p><b>CO 8:</b> Provide care to normal postnatal mothers and newborn</p> <p><b>CO 9:</b> Provide postnatal counseling</p> <p><b>CO 10:</b> Provide family welfare services</p>

S,NO	SUBJECT	COURSEOUTCOME
1	COHN SEMESTER 7	<p>CO1. Demonstrate beginning practice competencies/skills relevant to provide comprehensive primary health care/communitybased care to clients with common diseases and disorders including emergency and first aid care at home/clinics/centres</p> <p>CO2. as per predetermined protocols/drug standing orders approved by MOH&amp;FW</p> <p>CO3. Provide maternal, newborn and child care, and reproductive health including adolescent care in the urban and rural</p> <p>CO4. health care settings</p> <p>CO5. Describe the methods of collection and interpretation of demographic data</p> <p>CO6. Explain population control and its impact on the society and describe the approaches towards limiting family size</p> <p>CO7. Describe occupational health hazards, occupational diseases and the role of nurses in occupational health programs</p> <p>CO8. Identify health problems of older adults and provide primary care, counseling and supportive health services</p> <p>CO9. Participate in screening for mental health problems in the community and providing appropriate referral services</p> <p>CO10. Discuss the methods of data collection for HMIS, analysis and interpretation of data</p> <p>CO11. Discuss about effective management of health information in community diagnosis and intervention</p> <p>CO12. Describe the management system of delivery of community health services in rural and urban areas</p> <p>CO13. Describe the leadership role in guiding, supervising, and monitoring the health services and the personnel at the PHCs, SCs and community level including financial management and maintenance of records &amp; reports</p> <p>CO14. Identify the roles and responsibilities of health team members and explain their job description</p> <p>CO15. Demonstrate initiative in preparing themselves and the community for disaster preparedness and management</p> <p>CO16. Demonstrate skills in proper bio-medical waste management as per protocols</p> <p>CO17. Explain nurses' role in identification, primary management and referral of clients with common disorders/ conditions and emergencies including first aid</p> <p>CO18. Provide reproductive, maternal, newborn and childcare, including adolescent care in the urban and rural health care settings</p> <p>CO19. Discuss the concepts and scope of demography</p> <p>CO20. Discuss population explosion and its impact on social and economic development of India</p> <p>CO21. Describe the various methods of population control</p> <p>CO22. Describe occupational health hazards, occupational diseases and the role of nurses in Occupational health programs</p> <p>CO23. Identify health problems of older adults and provide primary care, counseling and supportive health services</p> <p>CO24. Describe screening for mental health problems in the community, take preventive measures and provide</p>

		<p>appropriate referral services</p> <p>CO25. Discuss about effective management of health information in community diagnosis and intervention</p> <p>CO26. Describe the system management of delivery of community health services in rural and urban areas</p> <p>CO27. Describe the leadership role in guiding, supervising, SSand monitoring the health services and the personnel at the PHCs, SCs and community level including financial management Describe the roles and responsibilities of Mid-Level Health Care Providers (MHCPs) in Health Wellness Centers (HWCs)</p> <p>CO28. Demonstrate initiative in preparing themselves and the community for disaster preparedness and management</p> <p>CO29. Describe the importance of biomedical waste management, its process and management</p> <p>CO30. Explain the roles and functions of various national and international health agencies</p>
2	RESEARCH	<p>DESCRIPTION: The Course is designed to enable students to develop an understanding of basic concepts of research, research process and statistics. It is further, structured to conduct/ participate in need-based research studies in various settings and utilize the research findings to provide quality nursing care. The hours for practical will be utilized for conducting individual/group research project.COMPETENCIES: On completion of the course, students will be competent to</p> <p>CO1. Identify research priority areas</p> <p>CO2. Formulate research questions/problem statement/hypotheses</p> <p>CO3. Review related literature on selected research problem and prepare annotated bibliography</p> <p>CO4. . Prepare sample data collection tool</p> <p>CO5. Analyze and interpret the given data</p> <p>CO6. Practice computing, descriptive statistics and correlation</p> <p>CO7. Draw figures and types of graphs on given select data</p> <p>CO8. Develop a research proposal</p> <p>CO9. Plan and conduct a group/individual research project</p> <p>CO10. describe the concept of research, terms, need and areas of research in nursing Explain the steps of research process State the purposes and steps of Evidence Based Practice</p> <p>CO11. Identify and state the research problem and objectives</p> <p>CO12. Review the related literature</p> <p>CO13. Describe the Research approaches and designs</p> <p>CO14. Explain the Sampling process</p> <p>CO15. Describe the methods of data collection</p> <p>CO16. Analyze, Interpret and summarize the research data</p> <p>CO17. Explain the use of statistics, scales of measurementand graphical presentation of data Describe the measures of central tendency and variability and methods of Correlation</p> <p>CO18. communicate and utilize the research</p>

		findings
3	OBG	<p>DESCRIPTION: This course is designed for students to develop knowledge and competencies on the concepts and principles of obstetric and gynecology nursing. It helps them to acquire knowledge and skills in rendering respectful maternity care to high risk woman during antenatal, natal and postnatal periods in hospitals and community settings and help to develop skills in initial management and referral of high risk neonates. It would also help students to gain knowledge, attitude and skills in caring for women with gynecological disorders.</p> <p>COMPETENCIES: On completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> <li>CO1. Describe the assessment, initial management, referral and respectful maternity care of women with high risk pregnancy.</li> <li>CO2. Demonstrate competency in identifying deviation from normal pregnancy.</li> <li>CO3. Describe the assessment, initial management, referral and nursing care of women with high risk labour.</li> <li>CO4. Assist in the conduction of abnormal vaginal deliveries and caesarean section.</li> <li>CO5. Describe the assessment, initial management, referral and nursing care of women with abnormal postnatal conditions.</li> <li>CO6. Demonstrate competency in the initial management of complications during the postnatal period.</li> <li>CO7. Demonstrate competency in providing care for high risk newborn.</li> <li>CO8. Apply nursing process in caring for high risk women and their families.</li> <li>CO9. Describe the assessment and management of women with gynecological disorders.</li> <li>CO10. Demonstrate skills in performing and assisting in specific gynecological procedures.</li> <li>CO11. Describe the drugs used in obstetrics and gynecology.</li> <li>CO12. Counsel and care for couples with infertility.</li> <li>CO13. Describe artificial reproductive technology.</li> </ul>
4	OBG ORACTICLE	<p>PRACTICE COMPETENCIES: On completion of the course, the students will be able to:</p> <ul style="list-style-type: none"> <li>CO1. Identify, stabilize and refer antenatal women with complications</li> <li>CO2. Provide care to antenatal women with complications</li> <li>CO3. Provide post abortion care&amp; counselling</li> <li>CO4. Assist in the conduction of abnormal vaginal deliveries and caesarean section.</li> <li>CO5. Demonstrate skills in resuscitating the newborn</li> <li>CO6. Assist and manage complications during labour</li> <li>CO7. Identify postnatal and neonatal complications, stabilize and refer them</li> <li>CO8. Provide care for high risk antenatal, intranatal and postnatal women and their families using nursing process approach</li> <li>CO9. Provide care for high risk newborn</li> </ul>

		<p>CO10. Assist in advanced clinical procedures in midwifery and obstetric nursing</p> <p>CO11. Provide care for women during their non childbearing period.</p> <p>CO12. Assess and care for women with gynecological disorders</p> <p>CO13. Demonstrate skills in performing and assisting in specific gynecological procedures</p> <p>CO14. Counsel and care for couples with infertility Counsel women and their families on pre-conception care</p> <p>CO15. Demonstrate lab tests ex. urine pregnancy test</p> <p>CO16. Perform antenatal assessment of pregnant women</p> <p>CO17. Assess and care for normal antenatal mothers</p> <p>CO18. Assist and perform specific investigations for antenatal mothers</p> <p>CO19. Counsel mothers and their families on antenatal care and preparation for parenthood</p> <p>CO20. Conduct childbirth education classes</p> <p>CO21. Organize labour room</p> <p>CO22. Prepare and provide respectful maternity care for mothers in labour</p> <p>CO23. Perform per-vaginal examination for a woman in labour if indicated</p> <p>CO24. Conduct normal childbirth with essential newborn care</p> <p>CO25. Demonstrate skills in resuscitating the newborn</p> <p>CO26. Assist women in the transition to motherhood</p> <p>CO27. Perform postnatal and newborn assessment</p> <p>CO28. . Provide care for postnatal mothers and their newborn</p> <p>CO29. . Counsel mothers on postnatal and newborn care</p> <p>CO30. . Perform PPIUCD insertion and removal</p> <p>CO31. . Counsel women on family planning and participate in family welfare services . Provide youth friendly health services</p> <p>CO32. . Identify, assess, care and refer women affected with gender based violence</p> <p><b>SKILL LAB: Procedures/Skills for demonstration and return demonstration:</b></p> <ol style="list-style-type: none"> <li>1. Antenatal assessment and identification of complications</li> <li>2. Post abortion care &amp; counseling</li> <li>3. Counseling antenatal women for complication readiness</li> <li>4. Mechanism of labour – abnormal</li> <li>5. Assisting in the conduction of abnormal vaginal deliveries and caesarean section.</li> <li>6. Management of complications during pregnancy/labour/post partum (case studies/simulated scenarios)</li> <li>7. Administration of Inj. Magnesium sulphate</li> <li>8. Starting and maintaining an oxytocin drip for PPH</li> <li>9. Management of PPH – Bimanual compression of uterus</li> <li>10. Management of PPH – Balloon tamponade</li> <li>11. Instruments used in obstetrics and gynecology</li> <li>12. Visual inspection of cervix with acetic acid</li> <li>13. Cervical biopsy</li> </ol>
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		14. Breast examination 15. Counselling of infertile couples
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## **Program: B.Sc. (Nursing) 4 Years Degree**

**Program Outcome:** Prepare nurses who can make independent decisions in nursing situations, protect the rights of, facilitate individuals and groups in pursuit of health, function in the hospital, community nursing services and conduct research studies in the areas of nursing practice. They are also expected to assume the role of teacher, supervisor and manager in a clinical / public health setting.

### **Program Specific Outcomes:**

**On completion of B.Sc. Nursing degree programme the graduates will be able to:**

1. Apply knowledge from physical, biological and behavioral sciences, medicine, including alternative systems and nursing in providing nursing care to individuals, families and communities.
  2. Demonstrate understanding of life style and other factors, which affect health of individuals and groups.
  3. Provide nursing care based on steps of nursing process in collaboration with the individuals and groups
  4. Demonstrate critical thinking skill in making decisions in all situations in order to provide quality care.
  5. Utilize the latest trends and technology in providing health care.
  6. Provide promotive, preventive and restorative health services in line with the national health policies and programs.
  7. Practice within the framework of code of ethics and professional conduct and acceptable standards of practice within the legal boundaries.
  8. Communicate effectively with individuals and groups and members of the health team in order to promote effective interpersonal relationships and teamwork.
  9. Demonstrate skills in teaching to individuals and groups in clinical/ community health settings.
  10. Participate effectively as members of the health team in health care delivery system.
- Demonstrate leadership and managerial skills in clinical / community health settings.
11. Conduct need based research studies in various settings and utilize the research findings to improve the quality of care.
  12. Demonstrate awareness, interest and contribute towards advancement of self and of the profession.

Course Outcomes (COs)	
B.Sc. (N) First year	
Placement - First year	
<b>English</b>	CO 1: Speak and write grammatically correct English CO 2: Develop ability to read, understand and express CO 3: meaningfully the prescribed text Develop writing skills CO 3: Develop skill in spoken English CO 4: Develop skill in listening comprehension
<b>Anatomy</b>	CO 1: Describe the anatomical terms, organization of human body and structure of cell, tissues, Membranes and glands CO 2: Describe the structure & function of bones and joints CO 3: Describe the structure and function of muscles CO 4: Describe the structure & function of nervous system CO 5: Explain the structure & functions of sensory organs CO 6: Describe the structure & function of circulatory and lymphatic system CO 7: Describe the structure & functions of respiratory system. CO 8: Describe the structure & functions of digestive system. CO 9: Describe the structure & functions of excretory system
<b>Physiology</b>	CO 1: Describe the physiology of cell, tissues, membranes and glands CO 2: Describe the bone formation and growth and movements of skeleton system CO3: Describe the muscle movements and tone and demonstrate muscle contraction and tone CO4: Describe the physiology of nerve stimulus, reflexes, brain, cranial and spinal nerves *Demonstrate reflex action and stimulus CO5: Describe the physiology of blood and functions of Heart Demonstrate blood cell count, coagulation, grouping, BP and Pulse monitoring CO 6: Describe the physiology and mechanism s of respiration demonstrate spirometry CO7: Describe the Physiology of digestive system Demonstrates BMR CO8: Describe the Physiology of excretory system CO 9: Describe the physiology of sensory organs CO 10: Describe the physiology of endocrine glands CO11: Describe the physiology of male and female reproductive system CO12: Describe the Physiology of Lymphatic and Immunological System
<b>Nutrition</b>	CO 1: Describe the relationship between nutrition & Health CO2: Describe the classification, functions, sources and recommended daily allowances (RDA) of carbohydrates CO3: Describe the classification, functions, sources and recommended daily allowances (RDA) of fats

	<p>CO4: Describe the classification, functions, sources and recommended daily allowances (RDA) of Proteins</p> <p>CO5: Describe the daily calorie requirement for different categories of people</p> <p>CO6: Describe the classification, functions, sources and recommended daily allowances (RDA) of Vitamins</p> <p>CO 7: Describe the classification, functions, sources and recommended daily allowances (RDA) of Minerals</p> <p>CO 8: Describe the sources, functions and requirements of Water &amp; Electrolytes</p> <p>CO 9: Describe the Cookery rules and preservation of nutrients Prepare and serve simple beverages and different types of foods</p> <p>CO 9: Describe and plan balanced diet for different categories of people</p> <p>CO10: Describe various National Programmes related to nutrition</p> <p>CO 12: Describe the role of nurse in assessment of nutritional status and Nutrition education</p>
<b>Biochemistry</b>	<p>CO 1: Describe the structure Composition and functions of cell Differentiate between Prokaryote &amp; Eukaryote cell Identify techniques of Microscopy</p> <p>CO 2: Describe the structure and functions of cell membrane</p> <p>CO 3: Explain the metabolism of carbohydrates Explain the metabolism of Lipids</p> <p>CO 4: Explain the metabolism of Amino acids and Proteins</p> <p>CO 5: Describe types, composition and utilization of Vitamins &amp; minerals</p> <p>CO 6: Describe Immunochemistry</p>
<b>Nursing Foundations</b>	<p>CO 1: Describe the concept of health, illness and health care agencies</p> <p>CO 2: Explain concept and scope of nursing</p> <p>CO 3: Describe values, code of ethics and professional conduct for nurses in India</p> <p>CO 4: Explain the admission and discharge procedure Performs admission and discharge procedure Communicate effectively with patient, families and team members and maintain effective human relations (projecting professional image) Appreciate the importance of patient teaching in nursing</p> <p>CO 5: Explain the concept, uses, format and steps of nursing process</p> <p>CO 6: Documents nursing process as per the format</p> <p>CO 7: Describe the purposes, types and techniques of recording and reporting</p> <p>CO 8: Describe principles and techniques of monitoring and maintaining vital signs Monitor and maintain vital signs</p> <p>CO 9: Describe purpose and process of health assessment</p> <p>CO 10: Describe the health assessment of each body system Perform health assessment of each body system</p> <p>CO 11: Identify the various machinery, equipment and linen and their care</p>

	<p>CO 12: Describe the basic, physiologic al &amp; psychological needs of patient</p> <p>CO 13: Describe the principles and techniques for meeting basic, Physiologic al and psychosocial needs of patient Perform nursing assessment, plan, implement and evaluate the care for meeting basic, physiologic al and psychosocial needs of patient</p> <p>CO 14: Describe principles and techniques for infection control and biomedical Waste management in Supervised Clinical Settings</p> <p>CO 15: Explain the principles, routes, effects of administration of medication Calculate conversions of drugs and dosages within and between systems of measurements Administer drugs by the following routes-oral, Intradermal Subcutaneous, Intramuscular, intra Venous, Topical, &amp; Inhalation</p> <p>CO 16: Describe the pre and post-operative care of patients Explain the process of wound healing Explain the principles and techniques of wound care Perform care of wounds</p> <p>CO 17: Explain care of patients having alterations in body functioning</p> <p>CO 18: Explain care of terminally ill patient Explain the basic concepts of Conceptual and theoretical models of nursing</p>
<b>Nursing Foundations – Practical</b>	
<b>Nursing Foundations – Practical</b>	<p>CO 1: Prepares nursing care plans as per the nursing process format Communicate effectively with patient, families and team members.</p> <p>CO 2: Maintain effective human relations Develops plan for patient teaching.</p> <p>CO 3: prepare patient reports Presents reports</p> <p>CO 4: Monitor vital signs Perform heath assessment of each body system</p> <p>CO 5: Provide basic nursing care to patients</p> <p>CO 6: Perform infection control procedures</p> <p>CO 7: Provide care to pre and post-operative patients</p> <p>CO 8: Perform procedures for care of wounds</p> <p>CO 9: Administer drugs Provide care to dying and dead Counsel and support relatives.</p>
<b>Microbiology</b>	<p>CO 1: Explain concepts and principles of microbiology and their importance in nursing.</p> <p>CO 2: Describe structure, classification morphology and growth of bacteria Identify Microorganisms</p> <p>CO 3: Describe the methods of infection control Identify the role of nurse in hospital infection control programme.</p> <p>CO 4: Describe the different disease producing organism's</p> <p>CO 5: Explain the concept of immunity, hyper sensitivity and immunization</p>
<b>Psychology</b>	<p>CO 1: Describe the history, scope and methods of Psychology.</p> <p>CO 2: Explain the Biology of Human behavior.</p> <p>CO 3: Describe various cognitive processes and their application.</p>

	<p>CO 4: Describe motivation, emotions, stress, attitudes and their influence on behaviour.</p> <p>CO 5: Explain the concepts of personality and its influence on behaviour.</p> <p>CO 6: Describe Psychology of people during the life cycle. CO 7: Describe the characteristics of mentally healthy person explain ego defense mechanisms.</p> <p>CO 8: Explain the Psychological assessment s and role of nurse</p>
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<b>COURSE</b>	<b>B.SC NURSING 2<sup>ND</sup> YEAR COURSE OUTCOME</b>
<b>SOCIOLOGY</b>	<p>CO 1: State the importance of Sociology in Nursing</p> <p>CO 2: Describe the inter- relationship of individual in society and community</p> <p>CO 3: Describe the influence of culture on health and disease</p> <p>CO 4: Identify various social groups and their terms</p> <p>CO 5: explain the growth in society</p> <p>CO 6: Describe the Institutions of family and marriage in India</p> <p>CO 7: Describe the class and caste system and their influence on health and practices</p> <p>CO 8: Describe the types of communities in India, their practices and the impact on health</p> <p>CO 9: Describe the types of communities in India, their practices and the impact on health</p> <p>CO 10: Explain the process of Social Change</p> <p>CO 11: Describe the Social system and inter- relationship of social organizations</p> <p>CO 12: Explain the nature and process of social control</p> <p>CO 13: Describe the role of the nurse in dealing with social problems in India</p> <p>CO 14: Describe the role of the nurse in dealing with social problems in India</p>

<b>PHARMACOLOGY</b>	<p>CO 1: Describe pharmacokinetics, classification and the principles of drug administration</p> <p>CO 2: Explain Chemotherapy of specific infections and infestations and nurse's responsibilities</p> <p>CO 3: Describe Antiseptics disinfectants, insecticides and nurse's responsibilities</p> <p>CO 4: Describe Drugs acting on Gastro Intestinal system and nurse's responsibilities</p> <p>CO 5: Describe Drugs used on Respiratory systems and nurse's responsibilities</p> <p>CO 6: Describe Drugs used on Urinary System and nurse's responsibilities</p> <p>CO 7: Describe Drugs used in de- addiction, emergency, deficiency of vitamins &amp; minerals, poisoning, for immunization and immuno- suppression and nurse's responsibilities</p> <p>CO 8: Describe Drugs used on skin and mucous membranes and nurse's responsibilities</p> <p>CO 9: Describe Drugs used on Nervous System and nurse's responsibilities</p>
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	<p>CO 10: Describe Drugs used on Cardiovascular System and nurse's responsibilities</p> <p>CO 11: Describe drugs used for hormonal disorders and Supplementation, contraception and medical termination of pregnancy and nurse's responsibilities</p> <p>CO 12: Demonstrate awareness of the common drugs used in alternative system of medicine</p>
<b>PATHOLOGY</b>	<p>CO 1: Define the common terms used in pathology</p> <p>CO 2: Appreciate the deviations from normal to abnormal structure and functions of the body system</p> <p>CO 3: Explain Pathological changes in disease conditions of various systems</p> <p>CO 4: Describe various laboratory tests in assessment and monitoring of disease conditions</p> <p>CO 5: Describe the laboratory tests for examination of body cavity fluids, transudates and exudates</p> <p>CO 6: Describe the laboratory tests for examination of body cavity fluids, transudates and exudates</p>
<b>GENETICS</b>	<p>CO 1: Explain nature, principles and perspective s of heredity</p> <p>CO 2: Explain Maternal, prenatal and genetic influences on development of defects and diseases</p> <p>CO 3: Explain the screening methods for genetic defects and diseases in neonates and children</p> <p>CO 4: Identify genetic disorders in adolescents and adults</p> <p>CO 5: Describe the role of nurse in genetic services and counseling</p>



<b>CET</b>	CO 1: Describe the communication process, Identify techniques of effective communication CO 2: Establish effective inter personal relations with patients' families & co-workers CO 3: Develop effective human relations in context of nursing CO 4: Develop basic skill of counselling and guidance CO 5: Describe the philosophy & principles of education Explain the teaching learning process CO 6: Demonstrate teaching skill using various teaching methods in clinical, classroom & community settings CO 7: Prepare and use different types of educational media effectively CO 8: Prepare different types of questions for assessment of knowledge, skills and attitudes CO 9: Teach individuals, groups and communities about health with their active participation
<b>COMMUNITY HEALTH NURSING - I (THEORY)</b>	CO 1: Describe concept and dimensions of health CO 2: Describe determinant s of health CO 3: Describe concept, scope, uses, methods and approaches of epidemiology CO 4: Describe Epidemiology and nursing management of common Communicable diseases CO 5: Describe Epidemiology and nursing management of common Non-communicable diseases CO 6: Describe the concepts & scope of Demography, Describe methods of data collection, analysis & interpretation of demographic data
	CO 7: Identify the impact of population explosion in India, Describe methods of population control
<b>COMMUNITY HEALTH NURSING - I (PRACTICAL)</b>	CO 1: 2 wks. urban and 2 wks. rural

<p><b>MEDICAL SURGICAL NURSING -I (THEORY)</b></p>	<p>CO1: Appreciate the trends in medical and surgical nursing</p> <ul style="list-style-type: none"> <li>• Describe the role of nurse in caring for adult patient in hospital and community</li> <li>• Describe the concepts of medical surgical asepsis</li> </ul> <p>CO 2: Describe the common signs, symptoms, problems and their specific nursing interventions</p> <p>CO 3: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of respiratory system</p> <p>CO 4: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of digestive system</p> <p>CO 5: Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients (adults including elderly) with blood and cardio vascular problems</p> <p>Describe the vascular conditions and its nursing management</p> <p>CO 6: Describe the etiology, pathophysiology, Clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of genito- urinary system</p> <p>CO 7: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of male reproductive system</p> <p>CO 8: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of endocrine system</p> <p>CO 9: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of skin</p> <p>CO 10: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of musculo skeletal system</p> <p>CO 11: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with disorders of immunological system</p> <p>CO 12: Describe the etiology, pathophysiology clinical manifestations, diagnostic measures and management of patients (adults including elderly) with Communicable Diseases.</p> <p>CO 13 : Describe the organisation and physical set up of Operation Theatre</p> <p>□ Identify the various instruments and equipments used for common</p>
	<p>surgical procedures</p> <ul style="list-style-type: none"> <li>• Describe the infection control measures in the operation theatre</li> <li>• Describe the role of the nurse in the Peri- operative nursing care</li> </ul>

<b>MEDICAL SURGICAL NURSING -I (THEORY)</b>	<p>CO 1: Provide nursing care to adult patients with medical disorders</p> <ul style="list-style-type: none"> <li>• Counsel and educate patients and families</li> </ul> <p>CO 2: Provide pre and post-operative nursing care to adult patients with surgical disorders</p> <ul style="list-style-type: none"> <li>• Counsel and educate patients and families</li> </ul> <p>CO 3: Provide nursing care to patients with cardiac disorders</p> <ul style="list-style-type: none"> <li>• Counsel and educate patients and families</li> </ul> <p>CO 4: Identify skin problems</p> <ul style="list-style-type: none"> <li>• Provide nursing care to patients with skin disorders &amp; Communicable diseases</li> <li>• Counsel and educate patients and families</li> </ul> <p>CO 5: Provide nursing care to patients with musculoskeletal disorders</p> <ul style="list-style-type: none"> <li>• Counsel and educate patients and families</li> </ul> <p>CO 6: Identify instruments used in common operations</p> <ul style="list-style-type: none"> <li>• Participate in infection control practices in the Operation Theatre</li> <li>• Set-up the table / trolleys for common operative procedures</li> <li>• Assist in giving anesthesia</li> <li>• Assist in the operative procedures Provide peri- operative nursing care</li> </ul>
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Course	B. Sc. Nursing 3 <sup>rd</sup> Year Course Outcome (COS)
<b>Medical Surgical Nursing II</b>	<p><b>CO 1:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Ear Nose and Throat.</p> <p><b>CO 2:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures and management of patients with disorders of Eye. <b>CO 3:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures &amp; nursing management of patients with Neurological disorders</p> <p><b>CO 4:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures &amp; nursing management of patients with disorders of female reproductive system</p> <p><b>CO 5:</b> Describe concepts of reproductive health &amp; family welfare programme</p> <p><b>CO 6:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures &amp; nursing management of patients with Burns, re- constructive and cosmetic surgery</p> <p><b>CO 7:</b> Describe the etiology, pathophysiology, clinical manifestations, diagnostic measures &amp; nursing management of patients with Oncology</p> <p><b>CO 8:</b> Describe organization of emergency &amp; disaster care services</p> <p><b>CO 9:</b> Describe the role of nurse in disaster management</p> <p><b>CO 10:</b> Describe the role of nurse in management of common Emergencie s</p> <p><b>CO 11:</b> Explain the concept and problems of Ageing</p> <p><b>CO 12:</b> Describe nursing care of the elderly</p>

	<p><b>CO 13:</b> Describe organization of critical care units</p> <p><b>CO 14:</b> Describe the role of nurse in management of patients in critical care units</p> <p><b>CO 15:</b> Describe the etiology, pathophysiology, clinical manifestations, assessment, diagnostic measures &amp; management of patients with Occupational and Industrial health disorder</p>
<b>Medical Surgical Nursing II- Practical</b>	<p><b>CO 1:</b> Provide care to patients with ENT disorders</p> <p><b>CO 2:</b> Provide care to patients with Eye disorders</p> <p><b>CO 3:</b> Provide care to patients with neurological disorders</p> <p><b>CO 4:</b> Provide care to patients with gynecological disorders</p> <p><b>CO 5:</b> Provide care to patients with Burns</p> <p><b>CO 6:</b> Provide care to patients with Cancer</p> <p><b>CO 7:</b> Provide care to critically ill patients</p> <p><b>CO 8:</b> Counsel patient and families for grief and bereavement</p> <p><b>CO 9:</b> Provide care to patients in emergency and disaster situation</p>
<b>Medical Surgical Nursing II- Internship</b>	<p><b>CO 1:</b> Provide comprehensive care to patients with medical and surgical conditions including emergencies <b>CO 2:</b> Assist with common operations.</p>
<b>Child Health Nursing</b>	<p><b>CO 1:</b> Explain the modern concept of child care &amp; principles of child health Nursing</p> <p><b>CO 2:</b> Describe national policy programs and legislation in relation to child health and welfare</p> <p><b>CO 3:</b> List major causes of death during infancy, early &amp; late childhood</p> <p><b>CO 4:</b> Describe the major functions and role of the pediatric nurse in caring for a hospitalized child.</p> <p><b>CO 5:</b> Describe the Normal growth &amp; development of children at different ages</p> <p><b>CO 6:</b> Identify the needs of children at different ages &amp; provide parental guidance</p> <p><b>CO 7:</b> Identify the nutritional needs of children at different ages and ways of meeting the needs</p> <p><b>CO 8:</b> Appreciate the role of play for normal &amp; sick children</p> <p><b>CO 9:</b> Appreciate the preventive measures and strategies for children</p> <p><b>CO 10:</b> Provide nursing care in common childhood diseases</p> <p><b>CO 11:</b> Identify measures to prevent common childhood diseases including immunization</p> <p><b>CO 12:</b> Manage the child with behavioral &amp; social problems</p> <p><b>CO 13:</b> Identify the social &amp; welfare services for challenged children</p>

<b>Child Health Nursing- Practical</b>	<p>CO 1: Provide nursing care to children with various medical disorders</p> <p>CO 2: Counsel and educate parents</p> <p>CO 3: Recognize different pediatric surgical conditions / malformations</p> <p>CO 4: Provide pre and post-operative care to children with common pediatric surgical conditions / malformation</p> <p>CO 5: Counsel and educate parents</p> <p>CO 6: Perform assessment of children - Health, Developmental and Anthropometric</p> <p>CO 7: Perform immunization</p> <p>CO 8: Give Health Education / Nutritional Education</p> <p>CO 9: Provide nursing care to critically ill children</p>
<b>Child Health Nursing- Internship</b>	<p>CO 1: Provide comprehensive care to children with medical conditions</p> <p>CO 2: Provide comprehensive care to children with surgical conditions</p> <p>CO 3: Provide intensive care to neonates</p>
<b>Mental Health Nursing</b>	<p>CO 1: Describe the historical development &amp; current trends in mental health nursing</p> <p>CO 2: Describe the epidemiology of mental health problems</p> <p>CO 3: Describe the National Mental Health Act, programmes and mental health policy</p> <p>CO 4: Discuss the scope of mental health nursing</p> <p>CO 5: Describe the concept of normal &amp; abnormal behavior</p> <p>CO 6: Define the various terms used in mental health nursing</p> <p>CO 7: Explain the classification of mental disorders</p> <p>CO 8: Explain psychodynamics of maladaptive behavior</p> <p>CO 9: Discuss the etiological factors, psychopathology of mental disorders</p> <p>CO 10: Explain the Principles &amp; standards of mental health nursing</p> <p>CO 11: Describe the conceptual models of mental health nursing</p> <p>CO 12: Describe nature, purpose &amp; process of assessment of mental health</p> <p>CO 13: Identify the therapeutic communication techniques</p> <p>CO 14: Describe therapeutic relationship</p> <p>CO 15: Describe therapeutic impasse and its intervention</p> <p>CO 16: Explain treatment modalities &amp; therapies used in mental disorders and role of the nurse</p> <p>CO 17: Describe the etiology, psychopathology, clinical manifestations, diagnostic criteria &amp; management of patients with Schizophrenia and other psychotic disorders</p> <p>CO 18: Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with mood disorders</p> <p>CO 19: Describe the etiology, psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with neurotic, stress related and Somatization disorders</p> <p>CO 20: Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with substance use disorders</p>

	<p><b>CO 21:</b> Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of patients with Personality, Sexual &amp; Eating disorders</p> <p><b>CO 22:</b> Describe the etiology psycho-pathology, clinical manifestations, diagnostic criteria and management of childhood and adolescent disorders including mental deficiency</p> <p><b>CO 23:</b> Describe the etiology, psycho-pathology, clinical manifestations, diagnostic criteria and management of organic brain disorders</p> <p><b>CO 24:</b> Identify psychiatric emergencies and carryout crisis intervention</p> <p><b>CO 25:</b> Explain legal aspects applied in mental health settings and role of nurse</p> <p><b>CO 26:</b> Describe the model of preventive psychiatry</p> <p><b>CO 27:</b> Describes Community Mental health services &amp; role of the nurse</p>
<b>Mental Health Nursing- Practical</b>	<p><b>CO 1:</b> Assess patients with mental health problems</p> <p><b>CO 2:</b> Observe &amp; assist in therapies</p> <p><b>CO 3:</b> Counsel &amp; educate patient, &amp; families</p> <p><b>CO 4:</b> Assessment of children with various mental health problems</p> <p><b>CO 5:</b> Counsel and educate children, families &amp; significant others</p> <p><b>CO 6:</b> Assess patients with mental health problems</p> <p><b>CO 7:</b> To provide nursing care for patients with various mental health problems</p> <p><b>CO 8:</b> Assist in various therapies</p> <p><b>CO 9:</b> Counsel &amp; educate patients, families &amp; significant others</p> <p><b>CO 10:</b> To identify patients with various mental disorders</p> <p><b>CO 11:</b> To motivate patients for early treatment &amp; follow up</p> <p><b>CO 12:</b> To assist in follow up clinic</p> <p><b>CO 13:</b> Counsel and educate patient, family and community</p>

<b>Mental Health Nursing- Internship</b>	<b>CO 1:</b> Provide comprehensive care to the patient with mental health problems.
<b>Nursing Research and Statistics</b>	<p><b>CO 1:</b> Describe the concept of research, terms, need and areas of research in Nursing</p> <p><b>CO 2:</b> Explain the steps of research process</p> <p><b>CO 3:</b> Identify and state the research problem and objectives</p> <p><b>CO 4:</b> Review of the literature</p> <p><b>CO 5:</b> Describe the research approaches &amp; designs</p> <p><b>CO 6:</b> Explain the sampling process</p> <p><b>CO 7:</b> Describe the methods of data collection</p> <p><b>CO 8:</b> Analyze, interpret and summarize the research data</p> <p><b>CO 9:</b> Explain the use of statistics, scales of measurement and graphical presentation of data</p> <p><b>CO 10:</b> Describe the measures of central tendency and variability and methods of correlation.</p> <p><b>CO 11:</b> Communicate and utilize the research findings</p>



SUBJECT	B.Sc. 4 <sup>th</sup> year Course outcome
<b>Obstetrics and Gynecology</b>	CO1. Recognize the trends and issues in midwifery and obstetrical Nursing CO2. Describe the anatomy and female reproductive system CO3. Describe the diagnosis and management of women during antenatal period CO4. Describe the physiology and stages of labour & CO5. Describe the management of women during intra- natal period CO6. Describe the physiology of puerperium & CO7. Describe the management of women during post- natal period CO8. Describe the Assessment and management of normal neonate CO9. Describe the Identification and management of women with high-risk pregnancy CO10. Describe management of abnormal labour and obstetrical emergencies CO11. Describe management of post-natal complications CO12. Identify the high-risk neonates and their nursing management CO13. Describe indication, dosage, action, side effects and nurses' responsibilities in the administration of drugs used for mothers CO14. Appreciate the Importance of family welfare programme & CO15. Describe the Methods contraception and role of nurse in Family welfare programme importance of methods of family welfare
<b>Community Health Nursing</b>	CO1. Define concepts, scope, principles and historical development of community Health and community Health Nursing CO2. Describe health plans, policies, various health committees and health problems in India CO3. Describe the system of delivery of community health services in rural and urban areas CO4. List the functions of various levels and their staffing pattern CO5. Explain the components of health services CO6. Describe alternative systems of health promotion and health maintenance CO7. Describe the chain of referral system. CO8. Describe Community Health Nursing approaches and Describe the roles and responsibilities of Community health nursing personnel. CO9. Describe and appreciate the activities of community health nurse in assisting individuals and groups to promote and maintain their health CO10. Describe National health and family welfare programmes and role of a nurse & Describe various health schemes in India. CO11. Explain the roles and functions of various national and international health agencies

<b>Nursing Management</b>	CO1. Explain the principles and functions of management CO2. Describe the elements and process of management CO3. Describe the management of nursing services in the hospital and community CO4. Describe the concepts, theories and techniques of organizational behaviour and human relations. CO5. Participate in planning and organizing in service education program. CO6. Describe management of nursing educational institutions CO7. Describe the ethical and legal responsibilities of a professional nurse; Explain the nursing practice standards. CO8. Explain the various opportunities for professional advancement.
<b>OBG Practical</b>	CO1. Assessment of pregnant women CO2. Assess woman in labour CO3. Carry out per- vaginal examination & Conduct normal deliveries CO4. Perform episiotomy and suture it & Resuscitate newborns & Assist with Cesarean Sections CO5. MTP and other surgical procedures CO6. Provide nursing care to post-natal mother and baby & Counsel and teach mother and family for parent hood CO7. Provide nursing care to newborn at risk CO8. Counsel for and provide family welfare services
<b>Community Health Nursing Practical</b>	CO1. Identify community profile CO2. Identify prevalent communicable and non- communicable diseases Diagnose health needs of Individual, families and community CO3. Plan, provide and evaluate care. CO4. Participate school health programme CO5. Participate in National health programmes CO6. Organize group for self-help and involve clients in their own health activities CO7. Provide family welfare services CO8. Counsel and educate Individual, family and community CO9. Collect Vital health statistics CO10. Maintain Records & Reports

## **Program: M.Sc.(Nursing)**

**Program Outcome:** The aim of the postgraduate program in nursing is to prepare graduates to assume responsibilities as nurse specialists, consultants, educators, administrators in a wide variety of professional settings

### **Program Specific Outcomes:**

On Completion of the two year M.Sc Nursing programme, the graduate will be able to:-

1. Demonstrate advance competence in practice of nursing
2. Practice as a nurse specialist.
3. Demonstrate leadership qualities and function effectively as nurse educator and manager.
4. Demonstrate skill in conducting nursing research, interpreting and utilizing the findings from health-related research.
5. Demonstrate the ability to plan and effect change in nursing practice and in the health care delivery system.
6. Establish collaborative relationship with members of other disciplines
7. Demonstrate interest in continued learning for personal and professional advancement  
Utilize/apply the concepts, theories and principles of nursing science

S. No	Course	Course Outcome
	<b>M.Sc.(N) Placement: 1<sup>st</sup> year</b>	
1.	<b>Nursing Education</b>	CO1.Explain the aims of education, philosophies, trends in education and health: its impact on nursing education. CO2. Describe the teaching learning process. CO3. Prepare and utilize various instructional media and methods in teaching learning process. CO4. Demonstrate competency in teaching, using various instructional strategies. CO5. Critically analyze the existing nursing educational programs, their problems, issues and future trends. CO6. Describe the process of curriculum development, and the need and methodology of curriculum change, innovation and integration. CO7. Plan and conduct continuing nursing education programs. CO8. Critically analyze the existing teacher preparation programs in nursing. CO9.Demonstrate skill in guidance and counseling. CO10. Describe the problems and issues related to administration of nursing curriculum including selection and organization of clinical experience. CO11. Explain the development of standards and accreditation process in nursing education programs. CO12. Identify research priorities in nursing education. CO13. Discuss various models of collaboration in nursing education and services.

2.	<b>Advance Nursing Practice</b>	<p>CO1. Appreciate and analyze the development of nursing as a profession.</p> <p>CO2. Describe ethical, legal, political and economic aspects of health care delivery and nursing practice.</p> <p>CO3. Explain bio- psycho- social dynamics of health, life style and health care delivery system.</p> <p>CO4. Discuss concepts, principles, theories, models, approaches relevant to nursing and their application.</p> <p>CO5. Describe scope of nursing practice.</p> <p>CO6. Provide holistic and competent nursing care following nursing process approach.</p> <p>CO7. Identify latest trends in nursing and the basis of advance nursing practice.</p> <p>CO8. Perform extended and expanded role of nurse.</p> <p>CO9. Describe alternative modalities of nursing care.</p> <p>CO10. Describe the concept of quality control in nursing.</p> <p>CO11. Identify the scope of nursing research.</p> <p>CO12. Use computer in patient care delivery system and nursing practice.</p> <p>CO13. Appreciate importance of self-development and professional advancement.</p>
3.	<b>Clinical Speciality - I Medical Surgical Nursing</b>	<p>CO1.Appreciate the trends &amp; issues in the field of Medical – Surgical Nursing as a speciality.</p> <p>CO2. Apply concepts &amp; theories related to health promotion.</p> <p>CO3. Appreciate the client as a holistic individual.</p> <p>CO4. Perform physical, psychosocial assessment of Medical – Surgical</p>
		<p>patients.</p> <p>CO5. Apply Nursing process in providing care to patients.</p> <p>CO6. Integrate the concept of family centred nursing care with associated disorder such as genetic, congenital and long-term illness.</p> <p>CO7. Recognize and manage emergencies with Medical- Surgical patients.</p> <p>CO8. Describe various recent technologies &amp; treatment modalities in the management of critically ill patients.</p> <p>CO9. Appreciate the legal &amp; ethical issues relevant to Medical – Surgical Nursing.</p> <p>CO10. Prepare a design for layout and management of Medical – Surgical Units.</p> <p>CO11. Appreciate the role of alternative systems of Medicine in care of patients.</p> <p>CO12. Incorporate evidence-based Nursing practice and identify the areas of research in the field of Medical – Surgical Nursing.</p> <p>CO13. Recognize the role of Nurse practitioner as a member of the Medical – Surgical health team.</p> <p>CO14. Teach Medical – Surgical Nursing to undergraduate nursing students &amp; in-service nurses.</p>

4.	<b>Clinical Specialty-I Obstetric and Gynecological Nursing</b>	<p>CO1.Appreciate the trends in the field of midwifery, obstetrics and gynaecology as a speciality.</p> <p>CO2. Describe the population dynamics and indicators of maternal and child health</p> <p>CO3. Describe the concepts of biophysical, psychological and spiritual aspects of normal pregnancy, labor and puerperium.</p> <p>CO4. Provide comprehensive nursing care to women during reproductive period and newborns.</p> <p>CO5. Integrate the concepts of family centered nursing care and nursing process approach in obstetric and gynaecological nursing.</p> <p>CO6. Identify and analyze the deviations from normal birth process and refer appropriately.</p> <p>O7. Describe the pharmacological agents, their effects during pregnancy, child birth, puerperium, lactation and the role of nurse</p> <p>CO8. Counsel adolescents, women and families on issues pertaining to pregnancy, child birth and lactation</p> <p>CO9. Describe the role of various types of complementary and alternative therapies in obstetric and gynecological nursing.</p> <p>CO10. Incorporate evidence-based nursing practice and identify the areas of research in the field of obstetric and gynecological nursing.</p> <p>CO11. Describe the recent advancement in contraceptive technology and birth control measures</p> <p>CO12. Appreciate the legal and ethical issues pertaining to obstetric and gynecological nursing</p>
5.	<b>Clinical Specialty -I Child Health (Pediatric) Nursing</b>	<p>CO1.Appreciate the history and developments in the field of pediatrics and Pediatric nursing as a specialty</p> <p>CO2. Apply the concepts of growth and development in providing care to the Pediatric clients and their families.</p> <p>CO3. Appreciate the child as a holistic Individual.</p> <p>CO4. Perform physical, developmental, and nutritional assessment of pediatric Clients.</p> <p>CO5. Apply nursing process in providing nursing care to neonates &amp; children.</p> <p>CO6. Integrate the concept of family centered pediatric nursing care with</p>
		<p>related areas such as genetic disorders, congenital malformations and long term illness.</p> <p>CO7. Recognize and manage emergencies in neonates</p> <p>CO8. Describe various recent technologies and treatment modalities in the management of high risk neonates</p> <p>CO9. Appreciate the legal and ethical issues pertaining to pediatric and neonatal nursing</p> <p>CO10. Prepare a design for layout and management of neonatal units</p> <p>CO11. Incorporate evidence based nursing practice and identify the areas of research in the field of pediatric/neonatal nursing</p> <p>CO12. Recognize the role of pediatric nurse practitioner and as a member of the pediatric and neonatal health team</p> <p>CO13. Teach pediatric nursing to undergraduate students &amp; in-service nurse</p>

6.	<b>Clinical Speciality - I Mental health (Psychiatric) Nursing</b>	CO1.Appreciate the trends and issues in the field of psychiatry and psychiatric nursing. CO2.Explain the dynamics of personality development and human behaviour. CO3.Describe the concepts of psychobiology in mental disorders and its implications for psychiatric nursing. CO4. Demonstrate therapeutic communications skills in all interactions. CO5.Demonstrate the role of psychiatric nurse practitioner in various therapeutic modalities. CO6. Establish and maintain therapeutic relationship with individual and groups. CO7. Uses assertive techniques in personal and professional actions CO8. Promotes self-esteem of clients, others and self CO9. Apply the nursing process approach in caring for patients with mental disorders. CO10. Describe the psychopharmacological agents, their effects and nurses role. CO11. Recognize the role of psychiatric nurse practitioner and as a member of the psychiatric and mental health team. CO12. Describe various types of alternative system of medicines used in psychiatric settings. CO13. Incorporate evidence based nursing practice and identify the areas of research in the field of psychiatric nursing.
7.	<b>Clinical Speciality- I Community Health Nursing</b>	CO1.Appreciate the history and development in the field of Community Health and Community Health Nursing. CO2. Appreciate role of individuals and families in promoting health of the Community. CO3. Perform physical, developmental and nutritional assessment of individuals, families and groups. CO4. Apply the concepts of promotive, preventive, curative and rehabilitative aspects of health while providing care to the people. CO5. Apply nursing process approach while providing care to individuals, families, groups and community. CO6. Integrate the concepts of family centered nursing approach while providing care to the community. CO7. Recognize and participate in the management of emergencies, epidemics and disasters. CO8. Apply recent technologies and care modalities while delivering community health nursing care.
		CO9. Appreciate legal and ethical issues pertaining to community health nursing care. CO10. Conduct community health nursing care projects. CO11. Participate in planning, implementation and evaluation of various national health and family welfare programmes at local, state and the national level. CO12. Incorporate evidence based nursing practice and identify the areas of research in the community settings.



8.	<b>Nursing Research and Statistics</b>	CO1. Define basic research terms and concepts. CO2. Review literature utilizing various sources CO3. Describe research methodology CO4. Develop a research proposal. CO5. Conduct a research study. CO6. Communicate research findings CO7. Utilize research findings CO8. Critically evaluate nursing research studies. CO9. Write scientific paper for publication.
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	<b>Placement -2<sup>nd</sup> Year</b>	
	<b>Course</b>	<b>Course Plan</b>
	<b>Nursing Management</b>	CO1. Describe the philosophy and objectives of the health care institutions at various levels. CO2. Identify trends and issues in nursing CO3. Discuss the public administration, health care administration vis a vis nursing administration CO4. Describe the principles of administration applied to nursing CO5. Explain the organization of health and nursing services at the various levels/institutions. CO6. Collaborate and co-ordinate with various agencies by using multi-sectoral approach CO7. Discuss the planning, supervision and management of nursing workforce for various health care settings. CO8. Discuss various collaborative models between nursing education and nursing service to improve the quality of nursing care CO9. Identify and analyse legal and ethical issues in nursing administration CO10. Describe the process of quality assurance in nursing services. CO11. Demonstrate leadership in nursing at various levels
	<b>A. Medical Surgical Nursing - Cardio Vascular and Thoracic Nursing</b>	CO1. Appreciate trends and issues related to cardio vascular and thoracic Nursing. CO2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of cardio vascular and thoracic conditions CO3. Participate in national health programs for health promotion, prevention and rehabilitation of patients with cardio vascular and thoracic conditions CO4. Perform physical, psychosocial & spiritual assessment CO5. Assist in various diagnostic, therapeutic and surgical procedures CO6. Apply nursing process in providing comprehensive care to patients with cardio vascular and thoracic conditions CO7. Demonstrate advance skills/competence in managing patients with cardio vascular and thoracic conditions including Advance Cardiac Life Support.

		<p>CO8. Describe the various drugs used in cardio vascular and thoracic conditions and nurses responsibility</p> <p>CO9. Demonstrate skill in handling various equipments/gadgets used for critical care of cardio vascular and thoracic patients</p> <p>CO10. Appreciate team work &amp; coordinate activities related to patient care.</p> <p>CO11. Practice infection control measures.</p> <p>CO12. Identify emergencies and complications &amp; take appropriate measures</p> <p>CO13. Discuss the legal and ethical issues in cardio vascular and thoracic nursing</p> <p>CO14. Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs.</p> <p>CO15. Appreciate the role of alternative system of medicine in care of patient</p> <p>CO16. Incorporate evidence based nursing practice and identify the are as of research in the field of cardio vascular and thoracic nursing</p> <p>CO17. Identify the sources of stress and manage burnout syndrome among health care providers.</p> <p>CO18. Teach and supervise nurses and allied health workers.</p> <p>CO19. Design a layout of ICCU and ICTU and develop standards for cardio vascular and thoracic nursing practice.</p>
	<p><b>B. Medical Surgical Nursing - Critical Care Nursing</b></p>	<p>CO1. Appreciate trends and issues related to Critical Care Nursing.</p> <p>CO2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of critically ill patients</p> <p>CO3. Describe the various responsibility</p> <p>CO4. Perform physical, psychosocial &amp; spiritual assessment</p> <p>CO5. Demonstrate advance skills/competence in managing critically ill patients including Advance Cardiac Life Support.</p> <p>CO6. Demonstrate skill in handling various equipments/gadgets used for critical care</p> <p>CO7. Provide comprehensive care to critically ill patients.</p> <p>CO8. Appreciate team work &amp; coordinate activities related to patient care.</p> <p>CO9. Practice infection control measures.</p> <p>CO10. Assess and manage pain .</p> <p>CO11. Identify complications &amp; take appropriate measures.</p> <p>CO12. Discuss the legal and ethical issues in critical care nursing</p> <p>CO13. Assist patients and their family to cope with emotional distress, spiritual, grief and anxiety</p> <p>CO14. Assist in various diagnostic, therapeutic and surgical procedures</p> <p>CO15. Incorporate evidence based nursing practice and identify the areas of research in the field of critical care nursing drugs used in critical care and nurses</p> <p>CO16. Identify the sources of stress and manage burnout syndrome among health care providers.</p> <p>CO17. Teach and supervise nurses and allied health workers.</p> <p>CO18. Design a layout of ICU and develop standards for critical care nursing practice.</p>

	<b>C. Medical Surgical Nursing-Oncology Nursing</b>	CO1. Explain the prevention, screening and early detection of cancer CO2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of oncological disorders of various body systems CO3. Describe the psychosocial effects of cancer on patients and families. CO4. Demonstrate skill in administering/assisting in various treatment modalities used for patients with cancer CO5. Apply nursing process in providing
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		cancer. CO6. Apply specific concepts of pain management CO7. Appreciate the care of death and dying patients and value of bereavement support. CO8. Describe the philosophy, concept and various dimensions of palliative care CO9. Appreciate the role of alternative systems of medicine in care of cancer patients CO10. Appreciate the legal & ethical issues relevant to oncology nursing CO11. Recognize and manage Oncological emergencies CO12. Counsel the patients with cancer and their families CO13. Incorporate evidence based nursing practice and identify the areas of research in the field of oncology nursing CO14. Recognize the role of oncology nurse practitioner as a member of oncology team CO15. Collaborate with other agencies and utilize resources in caring for cancer patients. CO16. Teach and supervise nurses and allied health workers. CO17. Design a layout and develop standards for management of oncology units/hospitals and nursing care.
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	<b>D. Medical Surgical Nursing-Neurosciences Nursing</b>	CO1. Appreciate trends and issues related to neurology and neurosurgical Nursing. CO2. Review the anatomy and physiology of nervous system CO3. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of patients with neurological and neurosurgical disorders CO4. Perform neurological assessment and assist in diagnostic procedures CO5. Describe the concepts and principles of neuroscience nursing CO6. Describe the various drugs used in neurosciences and nurses responsibility CO7. Assist in various therapeutic and surgical procedures in neuroscience nursing CO8. Demonstrate advance skills/competence in managing patients with neurological and neurosurgical disorder following nursing process approach CO9. Identify psychosocial problems of patients with disabilities and assist patients and their family to cope with emotional distress, spiritual, grief and anxiety CO10. Participate in preventive, promotive and rehabilitative services for neurological and neurosurgical patients. CO11. Explain the legal and ethical issues related to brain death, organ transplantation and practice of neuroscience nursing CO12. Incorporate evidence based nursing practice and identify the areas of research in the field of neuroscience nursing
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		<p>CO13. Organise and conduct inservice education program for nursing personnel.</p> <p>CO14. Develop standards of care for quality assurance in neuroscience nursing practice</p> <p>CO15. Identify the sources of stress and manage burnout syndrome among health care providers.</p> <p>CO16. Teach and supervise nurses and allied health workers.</p> <p>CO17. Plan and develop physical layout of neuro intensive care unit</p>
	<b>E. Medical Surgical Nursing- Nephro-</b>	<p>CO1. Appreciate trends and issues related to nephro and urological nursing</p>

	<b>Urology Nursing</b>	<p>CO2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of nephro and urological conditions CO3. Perform physical, psychosocial &amp; spiritual assessment</p> <p>CO4. Assist in various diagnostic, therapeutic and surgical interventions</p> <p>CO5. Provide comprehensive nursing care to patients with nephro and urological conditions</p> <p>CO6. Describe the various drugs used in nephro and urological conditions and nurses responsibility</p> <p>CO7. Demonstrate skill in handling various equipments/gadgets used for patients with nephro and urological conditions</p> <p>CO8. Appreciate team work &amp; coordinate activities related to patient care.</p> <p>CO9. Practice infection control measures.</p> <p>CO10. Identify emergencies and complications &amp; take appropriate measures</p> <p>CO11. Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs</p> <p>CO12. Discuss the legal and ethical issues in nephro and urological nursing CO13. Identify the sources of stress and manage burnout syndrome among health care providers</p> <p>CO14. Appreciate the role of alternative system of medicine in the care of patient</p> <p>CO15. Incorporate evidence based nursing practice and identify the areas of research in the field of nephro and urological nursing CO16. Teach and supervise nurses and allied health workers.</p> <p>CO17. Design a layout of kidney transplant unit and dialysis unit</p> <p>CO18. Develop standards of nephro urological nursing practice</p>
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	<b>2.F. Medical Surgical Nursing - Orthopedic Nursing</b>	<p>CO1. Appreciate the history and developments in the field of orthopedic nursing</p> <p>CO2. Identify the psycho-social needs of the patient while providing holistic care.</p> <p>CO3. Perform physical and psychological assessment of patients with orthopedic conditions and disabilities.</p> <p>CO4. Describe various disease conditions and their management</p> <p>5. Discuss various diagnostic tests required in orthopedic conditions CO6. Apply nursing process in providing care to patients with orthopedic conditions and those requiring rehabilitation.</p> <p>CO7. Recognize and manage orthopedic emergencies.</p> <p>CO8. Describe recent technologies and treatment modalities in the management of patients with orthopedic conditions and those requiring rehabilitation.</p>
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	<p><b>2.G. Medical Surgical Nursing - Gastro Enterology Nursing</b></p>	<p>CO1. Appreciate trends and issues related to gastro enterology nursing</p> <p>CO2. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of gastrointestinal conditions</p> <p>CO3. Participate prevention conditions</p> <p>CO4. Perform physical, psychosocial &amp; spiritual assessment</p> <p>CO5. Assist in various diagnostic, therapeutic and surgical procedures</p>
		<p>CO6. Provide comprehensive conditions</p> <p>CO7. Describe the various drugs used in gastrointestinal conditions and nurses responsibility</p> <p>CO8. Demonstrate skill in handling various equipments/gadgets used for patients with gastrointestinal conditions</p> <p>CO9. Appreciate team work &amp; coordinate activities related to patient care.</p> <p>CO10. Practice infection control measures.</p> <p>CO11. Identify emergencies and complications &amp; take appropriate measures</p> <p>CO12. Assist patients and their family to cope with emotional distress, grief, anxiety and spiritual needs</p> <p>CO13. Discuss the legal and ethical issues in GE nursing in national health programs for health promotion, and rehabilitation of patients with gastrointestinal care to patients with gastrointestinal</p> <p>CO14. Identify the sources of stress and manage burnout syndrome among health care providers</p> <p>CO15. Appreciate the role of alternative system of medicine in care of patient</p> <p>CO16. Incorporate evidence based nursing practice and identify the areas of research in the field of gastrointestinal nursing</p> <p>CO17. Teach and supervise nurses and allied health workers.</p> <p>CO18. Design a layout of Gastro enterology intensive care unit (GEICU) , liver care /transplant unit</p>

3.	<b>Obstetric and Gynaecological Nursing-ii</b>	<p>CO1. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of women with obstetric and gynaecological conditions</p> <p>CO2. Perform physical, psychosocial, cultural &amp; spiritual assessment</p> <p>CO3. Demonstrate competence in caring for women with obstetrical and gynaecological conditions</p> <p>CO4. Demonstrate competence in caring for high risk newborn.</p> <p>CO5. Identify and Manage obstetrical and neonatal emergencies as per protocol.</p> <p>CO6. Practice infection control measures</p> <p>CO7. Utilize recent technology and various diagnostic, therapeutic modalities in the management of obstetrical , gynecological and neonatal care.</p> <p>CO8. Demonstrate skill in handling various equipments/gadgets used for obstetrical, gynaecological and neonatal care</p> <p>CO9. Teach and supervise nurses and allied health workers.</p> <p>CO10. Design a layout of speciality units of obstetrics and gynecology</p> <p>CO11. Develop standards for obstetrical and gynaecological nursing practice.</p> <p>CO12. Counsel women and families</p> <p>CO13. Describe the epidemiology, etiology, pathophysiology and diagnostic assessment of women with obstetric and gynaecological conditions</p> <p>CO2. Perform physical, psychosocial, cultural &amp; spiritual assessment</p> <p>CO3. Demonstrate competence in caring for women with obstetrical and gynaecological conditions</p> <p>CO4. Demonstrate competence in caring for high risk newborn.</p> <p>CO5. Identify and Manage obstetrical and neonatal emergencies as per protocol.</p> <p>CO6. Practice infection control measures</p> <p>CO7. Utilize recent technology and various diagnostic, therapeutic</p>
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		<p>modalities in the management of obstetrical , gynecological and neonatal care.</p> <p>CO8. Demonstrate skill in handling various equipments/gadgets used for obstetrical, gynaecological and neonatal care</p> <p>CO9. Teach and supervise nurses and allied health workers.</p> <p>CO10. Design a layout of speciality units of obstetrics and gynecology</p> <p>CO11. Develop standards for obstetrical and gynaecological nursing practice.</p> <p>CO12. Counsel women and families</p> <p>CO13. Incorporate evidence based nursing practice and identify the areas of research in the field of obstetrical and gynaecological nursing</p> <p>CO14. Function as independent midwifery nurse practitioner</p>
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4.	<b>Pediatric (Child Health) Nursing-II</b>	<p>CO1.Apply the nursing process in the care of ill infants to pre-adolescents in hospital and community</p> <p>CO2.Demonstrate advanced skills/competence in nursing management of children with medical and surgical problems</p> <p>CO3. Recognize and manage emergencies in children</p> <p>CO4. Provide nursing care to critically ill children</p> <p>CO5.Utilize the recent technology and various treatment modalities in the management of high risk children</p> <p>CO6.Prepare a design for layout and describe standards for management of pediatric units/hospitals</p> <p>CO7. Identify areas of research in the field of pediatric nursing</p>
5.	<b>Psychiatric (Mental Health) Nursing-II</b>	<p>CO1.Apply the nursing process in the care of patients with mental disorders in hospital and community</p> <p>CO2.Demonstrate advanced skills/competence in nursing management of patients with mental disorders</p> <p>CO3. Identify and care for special groups like children, adolescents, women, elderly, abused and neglected, people living with HIV/ AIDS.</p> <p>CO4. Identify and manage psychiatric emergencies.</p> <p>CO5.Provide nursing care to critically ill patients with mental disorders</p> <p>CO6. Utilize the recent technology and various treatment modalities in the management of patients with mental disorders</p> <p>CO7. Demonstrate skills in carrying out crisis intervention.</p> <p>CO8. Appreciate the legal and ethical issues pertaining to psychiatric nursing.</p> <p>CO9. Identify areas of research in the field of psychiatric nursing.</p> <p>CO10.Prepare a design for layout and describe standards for management of Psychiatric units/emergency units/hospitals</p> <p>CO11. Teach psychiatric nursing to undergraduate students nurses. &amp; inservice</p>
7.	<b>Community Health Nursing-II</b>	<p>CO1.Appreciate trends and issues related to community health Nursing - reproductive and child health, school health, Occupational health, international health, rehabilitation, geriatric and mental health.</p> <p>CO2.Apply epidemiological concepts and principles in community health nursing practice</p> <p>3. Perform community health assessment and plan health programmes</p> <p>CO4.Describe the various components of Reproductive and child health programme.</p> <p>CO5.Demonstrate leadership abilities in organizing community health nursing services by using inter-sectoral approach.</p> <p>CO6.Describe the role and responsibilities of community health nurse in various national health and family welfare programmes</p>
		<p>CO7. Participate in the implementation of various national health and family welfare programme</p> <p>CO8. Demonstrate competencies in providing family centered nursing care independently</p> <p>CO9.Participate/Conduct research for new insights and innovative solutions to health problems</p> <p>CO10. Teach and supervise nurses and allied health workers.</p> <p>CO11.Design a layout of sub center/Primary health center/Community health center and develop standards for community health nursing practice.</p>

## Program Outcomes, Program Specific Outcomes, Course Outcomes

### MPH (Masters in Public Health)

Program Outcome	The course will help candidate to develop skills for collecting and interpreting information related to health, policy planning and development skills to address public health challenges, communication skills for advocacy, dissemination and evaluation of public health data and information, financial planning and management skills for running public health programs in the country.
Program Specific Outcome	The students will acquire the necessary skills to work as Epidemiologists, Public Health Consultants, Public Health Administrator, Public Health Researcher, NGO manager at local and national level. They can also contribute to the process of policy making by disseminating their research findings to policy makers.
Courses: MPH	Outcomes
Principles and Practices of Public Health	To analyse and implement principles of public health to practice and its impact on population health, equalities and quality of healthcare.
Introduction to Health System and Policy in Developing Countries	Helps the students to understand the policy process and policy environment within and outside the countries
Health Management: Management Principles and Practices (Strategic management)	To understand the administration, oversight of health systems, public health systems and entire hospitals and other medical facilities.
Demography and Population Sciences	Helps to understand the size, structure and movement of population over time and its relation to health
Principles of Social Research Methods and Basic Biostatistics	Helps to understand the traditional techniques of statistics applied to subject of public health
Basic Epidemiology	To understand the determinants of disease and causes which influence disease occurrence
Introduction to Health Economics	Provides information on efficient use of available resources for maximum health benefits.
Health Promotion Approaches and Methods	To engage the individuals and communities as well as empower them to choose healthy behaviour
Introduction to Financial Management and Budgeting	To provide understanding on proper management of resources in health

	organisations to improve patient care and minimise risk
Social and Behaviour Change, Effective Communication in Health Care	Details the information on how interventions in public health can be used to improve health behaviour in the population
Reproductive, Maternal Health, Child Health and adolescent (RMNCH+A)	It focuses on the measures taken to improve maternal and child health which not only benefits them but also strengthens families and communities
Introduction to Health Programs and evaluation	It includes how comprehensive health programs are used to achieve the health of the population
Environment and Occupational Health	It helps to understand how does physical, social and work environment has a bearing on health of the individuals and population
Law and Ethics in Public Health	Details the best legal practices available for the benefits of the patients
<b>Elective Subjects</b>	
Epidemiology	It helps to understand the distribution of diseases with more advanced applications.
Health program, Policy and Planning	Helps the students in translating research for health policy and advocacy
Health system management	Provides leadership and direction for the organisations that deliver health services in a detailed manner
RMNCH+ A	Details the fundamentals of reproductive health and nutrition for mother and child

## **Program Outcomes, Program Specific Outcomes and Course Outcomes**

### **Ph.D. in Public Health**

#### **Program Outcomes (POs)**

**PO1:** To develop skills for collecting and interpreting information related to public health

**PO 2:** Development of analytical and critical skills to address public health challenges in India

**PO 3:** Polish the communication skills for health advocacy

**PO 4:** Disseminating and evaluating public health data and information to inform policy making

**PO 5:** To develop critical acumen for running public health programs in the country

#### **Program Specific Outcome (PSOs)**

**PSO 1:** The students will acquire the necessary skills to work as Epidemiologists, Public Health Consultants, Public Health Administrator, Public Health Researcher, NGO manager at local and national level.

**PSO 2:** The students will contribute to the process of policy making by disseminating their research findings to policy makers.

**PSO 3:** Will help the student to enter academics and disseminate the learnings in public health to the community

<b>Course PhD (Public Health)</b>	<b>Course Outcomes (COs)</b>
<b>First semester</b>	
<b>Research Methodology (PH-601)</b>	<b>CO 1:</b> To provide necessary training in choosing methods, materials and scientific tools relevant for the chosen research problem. <b>CO 2:</b> Develop scientific thinking and inductive thinking and development of a critical temperament in research. <b>CO 3:</b> To put various research methods into the practice of public health.
<b>Methods in Public Health (PH-602)</b>	<b>CO 1:</b> To introduce various approaches to research methodologies in public health. <b>CO 2:</b> To introduce familiarity with various research methods used in public health <b>CO 3:</b> Choosing a theoretical framework within which various methods are to be placed while designing the study

<b>Social science perspectives of health and illness (PH-603)</b>	<b>CO 1:</b> To draw the intersectionalities among disciplines of social sciences and biomedical approach to health <b>CO 2:</b> To understand the concept of holistic approach to health and healthcare.
<b>Seminar (PH-604)</b>	<b>CO 1:</b> To hone the analytical as well as communication skill of the student <b>CO 2:</b> To read and analyse the latest research in area of Public Health
<b>Epidemiology (PH-605)</b>	<b>CO 1:</b> To define and delineate various theoretical and conceptual issues in Epidemiology. <b>CO 2:</b> To develop understanding of the social epidemiology apart from clinical epidemiology <b>CO 3:</b> To develop an epidemiological perspective to public health.
<b>Nutrition and health (PH-606)</b>	<b>CO 1:</b> To introduce various determinants which influence the access of food and the study of nutritional status and its linkages with health from a public health perspective. <b>CO 2:</b> To focus on the nutrition in women which in turn determines the nutritional status of the child. <b>CO 3:</b> To draw inferences from the epidemiology of nutrition in order to suggest or design policy approaches exclusive to nutrition in public health.
<b>Women's Health (PH-607)</b>	<b>CO 1:</b> To provide theoretical and conceptual understandings of the gender and how does gender determine health and access to healthcare specifically orienting it to India. <b>CO 2:</b> To understand the social inequalities in health from the perspective of <b>CO 3:</b> To use the dimension of gender while conducting research or any interventions for improvement of health in population.
<b>Second semester</b>	
<b>Comprehensive examination</b>	<b>CO 1: To evaluate the learning of the research scholar</b> <b>CO 2:</b> To prepare the scholar for uncertainties in research <b>CO 3:</b> to help develop clarity for carrying out research
<b>Synopsis writing</b>	<b>CO 1:</b> To finalise the area of research <b>CO 2:</b> To pilot the research design <b>CO 3:</b> To set an outline for final research
<b>Third, Fourth, Fifth and Sixth semester</b>	
<b>Undertake the research work for thesis</b>	<b>CO 1:</b> To visit the field for understanding nuances of research

	<b>CO 2:</b> To apply various methods of analysing the data <b>CO 3:</b> To disseminate the research findings
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## **CERTIFICATE COURSE ON GERIATRIC CARE ASSISTANT**

### **Program Outcome (PO)**

Upon completion of the **Geriatric Care Assistant** program, students will be able to:

1. **Provide comprehensive geriatric care** by assisting elderly patients in maintaining hygiene, mobility, nutrition, and daily activities.
2. **Demonstrate essential healthcare skills** including infection control, biomedical waste management, and basic clinical procedures.
3. **Assist in patient safety and comfort** through proper positioning, transferring, and fall prevention techniques.
4. **Recognize and respond to medical emergencies** including CPR, basic life support, and first aid measures.
5. **Maintain ethical and professional behavior** while working with elderly patients, families, and healthcare teams.
6. **Communicate effectively** with patients, families, and healthcare providers to ensure continuity of care.
7. **Manage documentation and reporting** related to patient care, including intake/output, vital signs, and unusual findings.
8. **Adapt to various geriatric healthcare settings** including hospitals, nursing homes, and home-based care.
9. **Follow biomedical waste disposal protocols** ensuring environmental safety and compliance with regulations.
10. **Provide emotional and psychological support** to geriatric patients, helping them cope with health changes and aging-related challenges.

### **Program Specific Outcomes (PSO)**

Upon successful completion of the **Geriatric Care Assistant** program, students will:

1. **Apply geriatric care principles** to ensure holistic well-being of elderly patients, considering their physical, mental, and emotional needs.
2. **Demonstrate proficiency in daily care activities** such as bathing, grooming, feeding, elimination assistance, and medication support.
3. **Implement infection control measures** and assist in maintaining a clean and safe healthcare environment.
4. **Recognize signs of common geriatric conditions** such as pressure sores, urinary tract infections, and dementia, and report them to healthcare professionals.
5. **Assist in last office (death care) procedures** following ethical and legal guidelines.
6. **Enhance quality of life for elderly patients** by promoting dignity, independence, and a patient-centered approach.

### **Course Outcomes (CO)**

Each module of the **Geriatric Care Assistant** program is designed to achieve specific learning outcomes.

### **Module-Wise Course Outcomes (CO):**

1. **Foundation Course** – Understand the role of a Geriatric Care Assistant, healthcare systems, basic emergency care, and professional ethics.
2. **Assist in Bathing the Patient** – Maintain hygiene, privacy, and infection control during patient bathing procedures.
3. **Assist in Grooming the Patient** – Perform oral care, hair care, and shaving while maintaining patient dignity.
4. **Assist Patient in Dressing Up** – Select appropriate clothing and use assistive devices to promote patient independence.
5. **Support Individuals to Eat and Drink** – Assist in feeding, ensuring dietary compliance and safety.
6. **Assist Patient in Maintaining Normal Elimination** – Provide urinary and bowel care, prevent infections, and manage incontinence.

7. **Assist in Transferring the Patient** – Implement safe patient handling techniques to prevent injuries.
8. **Prevent and Control Infection** – Follow hygiene protocols, personal protective measures, and infection prevention techniques.
9. **Assist in Performing Procedures as Instructed in the Care Plan** – Support nurses in patient monitoring, medication administration, and wound care.
10. **Assist Doctor/Nurse in Observing and Reporting Patient Condition** – Identify and report abnormal signs and symptoms in geriatric patients.
11. **Measuring Patient Parameters Accurately** – Take vital signs, monitor patient conditions, and maintain accurate records.
12. **Care and Management of Geriatric Patients with Pressure Sores** – Recognize, prevent, and manage pressure ulcers.
13. **Respond to Patient's Call** – Provide timely assistance and first aid in case of emergencies.
14. **Clean Medical Equipment & Biomedical Waste Management** – Maintain hygiene and proper disposal of biomedical waste.
15. **Follow Biomedical Waste Disposal Protocols** – Adhere to environmental safety standards in waste management.
16. **Enable Geriatric/Paralytic/Immobile Patients to Cope with Health Changes** – Provide psychological and physical support to aging patients.
17. **Implement Interventions with Geriatric/Paralytic/Immobile Patients at Risk of Falls** – Apply fall prevention strategies and emergency response measures.
18. **Carry Out Last Office (Death Care)** – Perform post-mortem care with dignity and professionalism.

**Program Outcome and Program Specific outcome of B.Sc. (Hons.)  
Agriculture Program**

<b>Program Outcome</b>	This program enables the students to acquire comprehensive knowledge in the different aspects of agriculture and its allied fields. It makes the student self-reliant to carry out all agriculture practices on her own, also to initiate small startup in her field of choice and earn her livelihood.
<b>Program Specific Outcome</b>	The student during this program has many options to drive her career in her desired field. She has the options to sharp her skills in the field of Seed Technology, Commercial Horticulture, Food Processing, Apiculture, Bioagents and Biofertilizers, Organic Production Technology, Floriculture and Landscaping, Waste Management. The students learn about these modules in a very comprehensive manner and can play lead roles in the field of Agriculture or as an entrepreneur.
<b>B.Sc. (Hons.) Agriculture</b>	
Agronomy	In this aspect of agriculture, the student learns to practice different agronomical parameters of various crops such as seeds and sowing, tillage, crop density and geometry, nutrient use efficiency, irrigation and logging.
Genetics & Plant Breeding	In this area of agriculture study the various strategies about crop improvement. They also learn field exercises such as emasculation, pollination and bagging.
Soil Science & Agricultural Chemistry	In this the students learn various soil aspects such as soil genesis, soil profile, soil physical properties, soil taxonomy and soil reactions.
Entomology	This subject provides students detailed account of insects such as insect morphology, ecology, classification and integrated pest management.
Agricultural Economics	The student learns various economical aspects of agriculture. It learns meaning, scope and subject matter, definitions, activities, approaches to economic analysis; micro and macroeconomics.
Agricultural Engineering	In this subject the student learns about different engineering practices related to soil and water conservation, farm and power machinery & renewable and green technology.
Plant Pathology	In this aspect the student studies various plant pathogens such as bacteria/mollicutes, fungi, virus, nematodes, their life cycle along with their eradication strategies in agricultural and horticultural crops.
Horticulture	The students, in this aspect, learn about different productions technologies in fruit and plantation crops, vegetable & spices, ornamental, medicinal & aromatic plants (MAPs) and landscaping.
Food Science	In this aspect the student learns about food chemistry,

	composition, microbiology, processing, preservation, and nutrition and energy metabolism.
Agricultural Extension	This subject gives comprehensive knowledge regarding extension education such as community development, rural development, rural leadership, ICT application, models and barriers to communication.
NSS/NCC/Physical Education & Yoga Practices	These courses evoke social consciousness among students through various activities viz., working together, constructive and creative social work, to be skillful in executing democratic leadership, developing skill in programme development to be able for self-employment, reducing gap between educated and uneducated, increasing awareness and desire to help sections of society.
Rural Agriculture Work Experience (RAWE)	<p>Rural Agriculture Work Experience also enables the students to gain rural experience giving them confidence and enhancing on-farm problem solving abilities in real life situations especially in contact with farmers, growers, and other stakeholders.</p> <p>In-plant Training for a short period of time in relevant industry helps gain the knowledge and experience of the work culture. In-plant Training by reputed organizations either MNCs or organized sectors provide an industrial exposure to the students as well as helps develop their career in high tech industrial requirements.</p> <p>Skill Development component includes use of Agriculture Systems &amp; devices for enhancing functional skill. It is expected that basic infrastructure and Experiential Learning Unit available in universities may help in boosting livelihood-ensuring opportunities.</p> <p>Student Project is essential for students interested in higher education. Through this component, they will know how to identify research problem, create experimental set up and to write report.</p>
Rural Entrepreneurship Awareness Development Yojana (READY)	Experiential Learning helps the student to develop competence, capability, capacity building, acquiring skills, expertise, and confidence to start their own enterprise and turn job creators instead of job seekers. This embraces the earning while learning concept. Experiential Learning is a major step forward for high quality professional competence, practical work experience in real life situation to graduates, production-oriented courses, production to consumption project working, facilitates producing job providers rather than job seekers and inculcates entrepreneurial orientation.
<b>Course Outcomes</b>	<b>Courses offered in Semester I</b>
<b>Course code: Agron-101</b> <b>Course Title: Agricultural Heritage"</b>	<b>Outcomes</b>

CO1	Describe general Introduction of agriculture.
CO2	Give the history of agricultural development
CO3	Describe ancient India agriculture in civilization era
CO4	Describe assets and contrasting trends & agricultural growth
CO5	Identified liabilities: Soil factors, weather factors
CO6	Describe multifaceted roles and tasks of women in agriculture
CO7	Describe empowerment of women & group dynamics
CO8	Identified the nucleus of agricultural extension and training
<b>Course code: Soil-101</b> <b>Course Title:</b> <b>"Fundamentals of soil science"</b>	<b>Outcomes</b>
CO1	Give the pedological and edaphological concepts
CO2	Classify Composition: rocks and minerals weathering
CO3	Identify Soil profile, soil physical properties, soil texture
CO4	Study soil compaction & soil color
CO5	Identify soil water, retention and potentials
CO6	Describe soil colloids, properties, nature, types and significance
CO7	Classify soil organic matter, composition, decomposability
<b>Course code: Eng-101</b> <b>Course Title:</b> <b>"Comprehension and communication skills in English"</b>	<b>Outcomes</b>
CO1	Study the English Comprehension
CO2	Describe War minus shooting
CO3	Study A Dilemma: A layman looks at science Raymond B
CO4	Describe You and your English
CO5	Improve Written skills
CO6	Improve The style, importance of professional writing
<b>Course code: BT-101</b> <b>Course Title:</b> <b>"Fundamentals of Biochemistry and Biotechnology"</b>	<b>Outcomes</b>
CO1	Study Scope and importance of biochemistry in agriculture
CO2	Identify Structure, properties and functions of amino acids
CO3	Write classification, structure and functions of Lipids
CO4	Write Classification, structure and functions of carbohydrates
CO5	Study Metabolism: basic concepts, glycolysis & citric acid cycle
CO6	Describe the central dogma of life; DNA replication
CO7	Study structure and biological functions of vitamins
<b>Course code: Agron-102</b> <b>Course Title:</b> <b>"Fundamentals of</b>	<b>Outcomes</b>



<b>Agronomy"</b>	
CO1	Study meaning and scope of agronomy
CO2	Planting geometry and its effect on growth and yield
CO3	Study agricultural meteorology: weather and climate
CO4	Study earth's atmosphere, composition and structure
CO5	Identify atmospheric, temperature, factors affecting air pressure
CO6	Write wind: factors affecting, cyclones and anticyclones
CO7	Describe process of condensation, formation of dew & fog
<b>Course code: Bot-101 Course Title: "Introductory Biology"</b>	<b>Outcomes</b>
CO1	Classify and introduction to different groups of the plant kingdom
CO2	Study morphology: Structure of seeds of different plants
CO3	Identify roots: External characters and functions
CO4	Identify stem: External characters and functions
CO5	Identify leaf: Parts of a typical leaf and their functions
CO6	Identify inflorescence: Elementary knowledge of simple and special types
CO7	Identify pollination: Types of pollinations, agencies responsible for pollination
CO8	Study reproduction in plants: Vegetative, and sexual
<b>Course code: Math-101 Course Title: "Elementary Mathematics"</b>	<b>Outcomes</b>
CO1	Understand mensuration of rectangles
CO2	Study volumes of cubes and rectangular solids
CO3	Study algebra: Solution of quadratic equations
CO4	Study algebra: Series: nth terms sum to n terms of an AP and GP
CO5	Understand co-ordinate geometry
<b>Course code: Edu-101 Course Title: "Human values &amp; ethics"</b>	<b>Outcomes</b>
CO1	Understand the need, basic guidelines of value education
CO2	Understand the human being as co-existence of self
CO3	Study basis for universal human values and ethical human conduct
CO4	Understand professional ethics, issues in professional ethics
CO5	Study the holistic criteria for evaluation, case studies of typical holistic technologies
<b>Course Code: Forst-101 Course Title: Introduction to forestry</b>	<b>Outcomes</b>
CO1	Write about the forestry- definition, scope and important terminology
CO2	Classify Status of forests in India and their role
CO3	Write down the National and International forestry organizations

CO4	Write down the Locality factors: climatic, edaphic, topographical and biotic
CO5	Describe choice of species w.r.t site/economic uses and constraints of tree growing
CO6	Identify the Forest management: growing stock, normal forest
CO7	Write down the Forest utilization major and minor forest products
<b>Course Code: Ext-101</b> <b>Course Title: Rural sociology and educational psychology</b>	<b>Outcomes</b>
CO1	Describe extension education and agricultural extension: meaning, definition, scope and importance
CO2	Explain Indian rural society, important characteristics, differences and relationship between rural and urban societies
CO3	Describe Social Stratification: meaning, definition, functions, basis for stratification
CO4	Write down Social values and attitudes: Meaning, definition, types and role of social values and attitudes in agricultural extension
CO5	Describe Social Control: meaning, definition, need of social control and means of social control
CO6	Identify Leadership: meaning, definition, classification, roles of a leader, different methods of selection of professional and lay leaders
CO7	Write down psychology and educational psychology: meaning, definition,
	Scope and importance
CO8	Personality: meaning, definition, types, factors influencing the personality and role of personality in agricultural extension
<b>Course code: HORT-101;</b> <b>Course Title: Fundamentals of Horticulture</b>	<b>Outcomes</b>
CO1	Give different methods of plant propagation.
CO2	Give principles of orchard establishment.
CO3	What is unfruitfulness?
CO4	What is the importance of plant bio regulators?
	Enumerate different irrigation methods and fertilizers for horticulture crops?
<b>Course Outcomes</b>	<b>Courses offered in Semester II</b>
<b>Course code: Econ102</b> <b>Course Title: Fundamental of Agricultural Economics"</b>	<b>Outcomes</b>

CO1	Understand economics: meaning, definition, subject matter
CO2	Study wants: Meaning, characteristics, classifications of wants
CO3	Study consumer's surplus: Meaning, definition, importance
CO4	Understand elasticity of demand: Types of elasticity of demand
CO5	Study welfare economics: meaning, pareto's optimality
CO6	Study public finance: Meaning, principles
CO7	Understand classification of taxes: Cannons of taxation
<b>Course code: PBG-102</b> <b>Course Title:</b> <b>"Fundamentals of Genetics"</b>	<b>Outcomes: Describe general principles of genetics</b>
CO1	Study Mendel's laws of inheritance and exceptions to the laws
CO2	Significance and differences between mitosis and meiosis
CO3	Describe crossing over and factors affecting crossing over
CO4	Describe characteristic features of cytoplasmic inheritance
CO5	Identify DNA and its structure, function, types
CO6	Write Gene expression and differential gene activation Co7 Evolution of different crop species like cotton, wheat
<b>Course code: Bot-102</b> <b>Course Title:</b> <b>Fundamentals of Crop physiology"</b>	<b>Outcomes</b>
CO1	Give Introduction, importance in agriculture
CO2	Study Seed viability and vigor
CO3	Classify monocarpic and polycarpic species with example
CO4	Study transpiration in relation to crop productivity
CO5	Understand Photorespiration, factors affecting photosynthesis
CO6	Study Plant growth regulators
CO7	Understand Postharvest physiology, seed dormancy
<b>Course code: Pl PATHt102</b> <b>Course Title:</b> <b>Fundamentals of plant pathology"</b>	<b>Outcomes</b>
CO1	Study important plant pathogenic organisms
CO2	Study classification of prokaryotes
CO3	Write definition and objectives of plant pathology
CO4	Identify plant disease epidemiology
CO5	Study cultural methods, rouging
CO6	Understand methods of application of fungicides
CO7	Study application of biotechnology in plant
<b>Course code: En102</b> <b>Course Title:</b> <b>Fundamentals of Entomologic"</b>	<b>Outcomes</b>
CO1	Give History of entomology in India

CO2	Study Structure and functions of insect cuticle and moulting
CO3	Understand structure and modifications of insect antennae
CO4	Study structure and functions of digestive, circulatory system
CO5	Study Systematics: Taxonomy, importance, history and development and binomial nomenclature
<b>Course code: Ex102</b> <b>Course Title:</b> <b>Fundamentals of agricultural extension and education"</b>	<b>Outcomes</b>
CO1	Give Extension education and agricultural extension
CO2	Identify Rural development; meaning, definition
CO3	Study Community development programme
CO4	Study Panchayat raj system, meaning of democratic
CO5	Study Agricultural development programmes with reference to year of start
CO6	Study social Justice and poverty alleviation programmes
CO7	Study Women development programmes
<b>Course code: S OIL-102</b> <b>Course Title: Soil and Water Conservation engineering</b>	<b>Outcomes</b>
CO1	Identify Surveying: survey equipment, chain survey
CO2	Understand Levelling-levelling equipment, terminology
CO3	Study Irrigation, classification of projects
CO4	Understand water conveyance systems
CO5	Study drip and sprinkle irrigation systems
CO6	Study water source, water lifting devices
CO7	Study soil and water conservation
<b>Course code: Micro-102</b> <b>Course Title: "Principles of Microbiology"</b>	<b>Outcomes</b>
CO1	Give the history of microbiology
CO2	Study metabolism in bacteria
CO3	Identify bacteriophages: structure and properties
CO4	Describe genetic recombination and bacterial genetics
CO5	Study soil microbiology & microbial groups in soil
CO6	Identify microbiology of water & microbiology of food
CO7	Classify beneficial microorganisms in agriculture
<b>Course code: ENG-102</b> <b>Course Title:</b> <b>Communication skills and personality development</b>	<b>Outcomes</b>
CO1	What is verbal and non-verbal communication?
CO2	What is reading and comprehension of general and technical

	articles.
CO3	What do you understand by oral and writing skills?
CO4	What do you understand by footnotes and bibliography
<b>Course Outcomes</b>	<b>Courses offered in Semester III</b>
<b>Course code: Agron-201</b> <b>Course Title: Crop</b> <b>Production Technology -I</b> <b>Kharif)"</b>	<b>Outcomes</b>
CO1	Give geographic distribution, economic importance of kharif crops
CO2	Study soil and climatic requirement, varieties, cultural practices
CO3	Study yield of kharif crops, oilseeds: groundnut, sesame
CO4	Study yield of kharif crops, fiber crops, cotton, jute
CO5	Identify forage crops, sorghum, maize, cowpea, cluster bean and napier grass
<b>Course code: AGIS-201</b> <b>Course Title:</b> <b>Agriniformatics"</b>	<b>Outcomes</b>
CO1	Give Introduction to computers
CO2	Understand Operating system, DOS and WINDOWS
CO3	Study GUI, desktop and its elements
CO4	Understand applications, MSWORD
CO5	Use of in-built statistical and other functions
CO6	Study Concept of database, units of database
CO7	Write Principles of programming
<b>Course code: Econ-201</b> <b>Course Title:</b> <b>"Agricultural finance and</b> <b>co-operation"</b>	<b>Outcomes</b>
CO1	Study agricultural finance: nature and scope
CO2	Identify agricultural credit: meaning, definition, need
CO3	Give History of financing agriculture in India
CO4	Understand Assessment of crop losses
CO5	Identify Higher financing agencies
CO6	Understand Agricultural cooperation: philosophy and principles
CO7	Reorganization of cooperative credit structure in Andhra Pradesh and single window system
<b>Course code: Hort-201</b> <b>Course Title: "Production</b> <b>technology of vegetables</b> <b>and spices"</b>	<b>Outcomes</b>
CO1	Study ash gourd, snake gourd, bottle gourd, bitter gourd and melons
CO2	Study Bulb crops-onion and garlic

CO3	Identify Tuber crops, potato, sweet potato, tapioca
CO4	Identify Leafy vegetables, Amaranthus, Palak, Gogu
CO5	Write Importance of spices
CO6	Use of trees, shrubs, climbers, palms, houseplants
<b>Course code: STAT-201</b> <b>Course Title: "Statistical Methods"</b>	<b>Outcomes</b>
CO1	Study definition of statistics and its use and limitations
CO2	Characteristics of ideal average, arithmetic mean
CO3	Study normal distribution and its properties
CO4	Study two samples and paired t test. F test
CO5	Understand correlation and identification through scatter diagram
CO6	Study Inter-relation between 'r' and the regression coefficients
CO7	layout and analysis with equal & unequal number of observations
<b>Course Code: Env-201</b> <b>Course Title: Environmental science and disaster management</b>	<b>Outcomes</b>
CO1	Explain scope and importance of environmental studies. Natural resources
CO2	Describe the ecosystems: definition, concept, structure and functions.
CO3	Describe biodiversity: Definition, classification, threats to biodiversity and its conservation.
CO4	Write down environmental pollution: causes, effects and control of air, water, soil
CO5	Explain disaster management, floods, earthquakes, cyclones and landslides
CO6	Write down the environment protection act, the air act, the water act, the wildlife protection.
CO7	Write down the woman and child welfare, HIV/AIDS and role of information technology on environment and human health
<b>Course Code: LPM-201,</b> <b>Course Title: Livestock production and management</b>	<b>Outcomes</b>
CO1	Describe place of livestock in the national economy
CO2	Write down Important exotic and Indian breeds of cattle, buffalo, sheep, goat
CO3	Describe milking of animals and factors affecting milk yield and composition
CO4	Write down feeding and management of calves, growing heifers and milch animals
CO5	Describe Disease control measures, sanitation and care, breeding, feeding



CO6	Write down breed characteristics of poultry, their methods of rearing, breeding, feeding and management,
CO7	Explain Cost of production of milk, economical units of cattle, buffalo, sheep, goat
<b>Course code: FPM-201 Course Title: "Farm power and machinery"</b>	<b>Outcomes</b>
CO1	Study farm power in India: sources, I.C engines
CO2	Identify tractors: types, selection of tractor
CO3	Study tillage implements: primary and secondary tillage implements
CO4	Study implements for intercultural operations
CO5	Identify Plant protection equipment and harvesting equipment
CO6	Identify equipment for land development and soil conservation
	<b>Credits 1 Theory period of one hour per week over a semester</b>
<b>Course code: PBG-102 Course Titl: Fundamentals of Plant Breeding</b>	<b>Outcomes</b>
CO1	Classify plants, botanical description, floral biology
CO2	Understand aims and objectives of plant breeding
CO3	Study methods of breeding-introduction and acclimatization
CO4	Understand Hybridization & types of hybridization
CO5	Identify Incompatibility and male sterility
CO6	Study Population improvement programmes
	<b>Credits 2 Theory period of one hour per week over a semester</b>
<b>Course Outcomes</b>	<b>Courses offered in Semester IV</b>
<b>Course code: Agron-202 Course Title: Crop Production Technology-II (Rabi)"</b>	<b>Outcomes</b>
CO1	Study Origin, geographical distribution, economic importance of Rabi crops
CO2	Study yield of Cereals: wheat, barley; Pulses: chickpea, lentil, peas
CO3	Study yield of sugar crops: sugarcane and sugar beet
CO4	Study yield of medicinal and aromatic crops such as Mentha, lemon grass
CO5	Study yield of commercial crops: potato and tobacco; forage crops: berseem
<b>Course code: HORT-203 Course Title: "Production technology of fruit and Plantation crops"</b>	<b>Outcomes</b>

CO1	Give Definition and importance of horticulture
CO2	Identify Climatic zones of horticulture crops
CO3	Selection of site, fencing, and wind break, planting systems
CO4	Study propagation methods and use of rootstocks
CO5	Study methods of training and pruning
CO6	Understand package of practices for the cultivation of major fruit
CO7	Understand package of practices for the cultivation of minor fruits
<b>Course Code: RE-202</b> <b>Course Title: Renewable Energy &amp; Green Technology</b>	<b>Outcomes</b>
CO1	Explain energy sources, introduction, classification, energy from biomass
CO2	Classify Principles of combustion, pyrolysis and gasification
CO3	Describe briquettes, types of briquetting machines, uses of briquettes, shredders
CO4	Write down the solar energy, solar flat plate and focusing plate collectors, solar air heaters
CO5	Describe solar refrigeration system, solar ponds, solar photo voltaic systems, solar lantern, solar street lights
CO6	Identify wind energy, types of wind mills, constructional details
CO7	Write down the liquid bio fuels, bio diesel and ethanol from agricultural produce
<b>Course code: Hort-203</b> <b>Course Title: " Production technology of Ornamental crops, MAP and Landscaping</b>	<b>Outcomes</b>
	<b>Medicinal and Plantation Crops"</b>
CO1	What do you understand by Ornamental crops?
CO2	Study importance and cultivation technology of aromatic crops?
CO3	What is Landscaping?
CO4	Study importance and cultivation technology of medicinal plants:
CO5	Identify Importance and cultivation technology of medicinal plants: nuxvomica, solanum khasiamum,
<b>Course Code: Soil-202</b> <b>Course Title: Problematic Soil and their management</b>	<b>Outcomes</b>
CO1	Explain Soil a water reservoir, role in water cycle
CO2	Describe Forces of water retention. Soil water potential
CO3	Describe the Soil, plant, atmosphere continuum, indices of plant water status
CO4	Write down the Soil moisture characteristics, evaporation in the presence and absence of water table

CO5	Describe Soil erosion by water - types, effects, mechanics
CO6	Identify Rain erosivity and soil erodibility. Runoff
CO7	Write down the Soil conservation measures
<b>Course code: PBG-202</b> <b>Course Title: "Principles of seed technology"</b>	<b>Outcomes</b>
CO1	Give Introduction to seed production
CO2	Study seed production, foundation and certified seed production in maize
CO3	Identify foundation and certified seed production of tomato and brinjal
CO4	Study seed Act and Seed Act enforcement
CO5	Study seed drying: forced air seed drying
CO6	Identify establishment of seed processing plant
CO7	Study general principles of seed storage
<b>Course Code: Agron-203</b> <b>Course Title: Farming systems and sustainable agriculture</b>	<b>Outcomes</b>
CO1	Describe sustainable agriculture, its goal and prospective
CO2	Identify land degradation and conservators of natural resources
CO3	Describe irrigation problems, waste lands and their development
CO4	Write down organic farming definition, principles and components
CO5	Describe Farming systems: definition, principles and components
CO6	Write down IFS models for wetland, irrigated dryland and dryland situations
<b>Course Code: Econ-202</b> <b>Course Title: Agricultural marketing, trade and prices</b>	<b>Outcomes</b>
CO1	Describe agricultural marketing: concepts and definition, scope and subject matter, market and marketing
CO2	Explain producer's surplus: meaning, types of producer's surplus, marketable surplus
CO3	Write down market integration, meaning, definition, types of market integration. marketing efficiency
CO4	Write down Theories of international trade: Domestic trade, free trade, international trade
CO5	Identify market access, domestic support, export subsidies, Exim-policy and ministerial conferences
CO6	Identify advantages of food corporation of India: Objectives and functions. quality control
CO7	Write down meaning, need for agricultural price policy. Risk in marketing, meaning and importance

<b>Course code: Agron-204</b> <b>Course Title:</b> <b>"Introductory Agro-meteorology and climate change"</b>	<b>Outcomes</b>
CO1	Study meaning and scope of agronomy
CO2	Planting geometry and its effect on growth and yield
CO3	Study agricultural meteorology: weather and climate
CO4	Study earth's atmosphere, composition and structure
CO5	Identify atmospheric, temperature, factors affecting air pressure
CO6	Write wind: factors affecting, cyclones and anticyclones
CO7	Describe process of condensation, formation of dew & fog
<b>Course Outcomes</b>	<b>Courses offered in Semester V</b>
<b>Course Code: Ent-301</b> <b>Course Title: Insect pests of crop and stored grains and their management</b>	<b>Outcomes</b>
CO1	Classify stored grain pests: Coleopteran and lepidopteran pests, their biology
CO2	Write down distribution, biology, nature and symptoms of damage, and management strategies of insect and non-insect pests of crop plants
CO3	Write down distribution, biology, nature and symptoms of damage, and management strategies of insect and non-insect pests of cereals
CO4	Write down Distribution, biology, nature and symptoms of damage, and management strategies of insect and non-insect pests' vegetable
CO5	Write down distribution, biology, nature and symptoms of damage, and management strategies of insect and non-insect pests of fruit trees
CO6	Write down distribution, biology, nature and symptoms of damage, and management strategies of insect and non-insect pests of spices
<b>Course Code: Agron-302</b> <b>Course Title: Practical crop production I (Kharif crops)</b>	<b>Outcomes</b>
CO1	Write crop planning, raising field crops in multiple cropping systems
CO2	Practical Field preparation, seed treatment, nursery raising, sowing, nutrient management
CO3	Practical of weed management and management of insect pests and diseases of crops

CO4	Preparation of balance sheet including cost of cultivation, net returns
<b>Course Code: Pl. Path-302</b> <b>Course Title: Disease of field &amp; horticultural crops and their management-I</b>	<b>Outcomes</b>
CO1	Write down economic importance, symptoms, cause, disease cycle and integrated management of diseases of fruits
CO2	Write down economic importance, symptoms, cause, disease cycle and integrated management of diseases of vegetable.
CO3	Write down economic Importance, symptoms, cause, disease cycle and integrated management of diseases of cucurbits
CO4	Study integrated management of diseases of maize, wheat
CO5	Study management of diseases of sugarcane, turmeric, tobacco
CO6	Study epidemiology and disease cycle of diseases of linseed, sesamum, sunflower
<b>Course code: Ent-202</b> <b>Course Title" Principles of integrated pest and disease management"</b>	<b>Outcomes</b>
CO1	Study IPM; Introduction, importance, concepts principles
CO2	Identify biological methods of control (parasites, predators
CO3	Study of important insecticides
CO4	Study recent methods of pest control, repellents
CO5	Identify beneficial insects: parasites and predators used in pest control
<b>Course code: Soil-301</b> <b>Course Title: "Manures, fertilizers and Soil fertility Management"</b>	<b>Outcomes</b>
CO1	Give Introduction, raw materials, manures
CO2	Study composts, different methods, mechanical compost plants
CO3	Understand fertilizers, classifications, manufacturing processes and properties of major nitrogenous
CO4	Study bio fertilizers and their advantage
CO5	Identify organic chemistry as prelude to agro chemicals
CO6	Study Herbicides, major classes, properties and uses of 2,4-D, atrazine
CO7	Study fungicides, major classes, properties and uses of carbendazim
<b>Course Code: Ext-301</b> <b>Course Title:</b> <b>Entrepreneurship development and Business Communication</b>	<b>Outcomes</b>
CO1	Describe entrepreneurship development: assessing overall

	business environment in the Indian economy
CO2	Explain globalization and the emerging business/entrepreneurial environment.
CO3	Describe SWOT analysis, generation, incubation and commercialization of ideas and innovations
CO4	Write down export and import policies relevant to agriculture sector. Venture capital
CO5	Describe communication skills: structural and functional grammar; meaning and process of communication
CO6	Identify listening and note taking, writing skills, oral presentation skills; field diary and lab record
CO7	Write down individual and group presentations, impromptu presentation, public speaking
<b>Course Code: Agron-302</b> <b>Course Title: Practical crop production I (Kharif crops)</b>	<b>Outcomes</b>
CO1	Write crop planning, raising field crops in multiple cropping systems
CO2	Practical Field preparation, seed treatment, nursery raising, sowing, nutrient management
CO3	Practical of weed management and management of insect pests and diseases of crops
CO4	Preparation of balance sheet including cost of cultivation, net returns
<b>Course Code: IPR-301</b> <b>Course Title: Intellectual Property Rights</b>	<b>Outcomes</b>
CO1	What do you understand by IPR?
CO2	What is Patent?
CO3	Give different Patent systems in India.
CO4	What are the rights of TK holders?
<b>Course Code: AGRON-301</b> <b>Course Title: Geoinformatics and Nano-Technology and Precision Farming</b>	<b>Outcomes</b>
CO1	What do you understand by precision farming?
CO2	What is crop discrimination and yield monitoring?
CO3	What is global positioning system?
CO4	What is the STCR approach for precision Agriculture?
CO5	What are the different applications of Nanotechnology in seed, water, fertilizer and plant protection?
<b>Course Code: PBG-301</b> <b>Course Title: Crop Improvement I (Kharif)</b>	<b>Outcomes</b>



CO1	What do you understand by wild relatives of different cereals?
CO2	What is different plant genetic resources and their utilization?
CO3	Give the importance of different self and cross-pollinated cereal crops.
CO4	What are major breeding objectives and procedures?
<b>Course Outcomes</b>	<b>Courses offered in Semester VI</b>
<b>Course Code: Econ-302</b> <b>Course Title: Farm Management, Production &amp; Resource Economics</b>	<b>Outcomes</b>
CO1	Describe Production economics: Meaning, definition, nature and scope
CO2	Explain concepts of production. Production functions, meaning, definition
CO3	Describe Laws of returns: Increasing, constant and decreasing
CO4	Write down the determination of optimum input and output
CO5	Describe returns to scale: Meaning, definition, importance
CO6	Identify types and systems of farming. Farm planning and budgeting
CO7	Write down the linear programming: Assumptions, advantages and limitations
	<b>Credits 1 Theory period of one hour per week over a semester</b>
<b>Course Code: Agron-304</b> <b>Course Title: Practical crop production II (Rabi crops)</b>	<b>Outcomes</b>
CO1	Write crop planning, raising field crops in multiple cropping systems
CO2	Practical Field preparation, seed treatment, nursery raising, sowing, nutrient management
CO3	Practical of weed management and management of insect pests and diseases of crops
CO4	Preparation of balance sheet including cost of cultivation, net returns
<b>Course Code: Agron-304</b> <b>Course Title: Crop residue management</b>	<b>Outcomes</b>
CO1	Write down Significance of crop residue management
CO2	Explain challenges for diversified use of crop residue in high cropping intensity areas
CO3	Describe Crop residue in relation to agricultural ecosystems and conservation agriculture.
CO4	Write down on-site and off-site management of crop residues and soil health indicators

CO5	Describe beneficial effects of crop residue on soil health, crop yields
CO6	Write down recent technologies for conservation agriculture
CO7	Write down the Policy options for efficient residue management in Himachal
<b>Course Code: Agron-305</b> <b>Course Title: Principles of Organic farming</b>	<b>Outcomes</b>
CO1	Describe concept and relevance of organic farming
CO2	Explain biological intensive nutrient management-organic manures
CO3	Describe Vermicomposting, green manuring, recycling of organic residues
CO4	Write down the soil improvement and amendments
CO5	Describe Integrated diseases and pest management
CO6	Explain Weed management; Quality considerations, certification,
<b>Course Code: PBG-302</b> <b>Course Title: Crop Improvement I (Rabi)</b>	<b>Outcomes</b>
CO1	What do you understand by wild relatives of different cereals?
CO2	What is different plant genetic resources and their utilization?
CO3	Give the importance of different self- and cross-pollinated cereal crops.
CO4	What are major breeding objectives and procedures?
<b>Course Code: FSN-302</b> <b>Course Title: Principles of Food Science and Nutrition</b>	<b>Outcomes</b>
CO1	What do you understand by pH, surface tension, colloidal systems?
CO2	Describe food composition and chemistry
CO3	What are the different methods of food preservation and processing?
CO4	What do you understand by malnutrition?
CO5	What are different new trends in food science and nutrition?
<b>Course code: Agron-303;</b> <b>Course Title: Rainfed Agriculture and Watershed Management</b>	<b>Outcomes</b>
CO1	Study Irrigation: definition and objectives
CO2	Understand Soil plant water relationships
CO3	Identify Methods of soil moisture estimation
CO4	Identify effective rainfall, scheduling of irrigation
CO5	Understand Methods of irrigation
CO6	Study Irrigation efficiency and water use efficiency

CO7	Identify water management of different crops
<b>Course code: HORT-302; Course Title: Post-Harvest management and value addition of fruits and vegetables</b>	<b>Outcomes</b>
CO1	Write down importance of Postharvest technology in horticultural crops.
CO2	Explain pre-harvest factors affecting quality on postharvest shelf life of fruits and vegetables
CO3	Write down methods of storage: precooling, pre-storage treatments, low temperature storage
CO4	Describe various methods of packing, packaging materials and transport. Packing technology for export
CO5	Write down importance and scope of fruit and vegetable preservation in India
CO6	Write down preparation of jams, jellies, marmalades, candies, crystallized and glazed fruits
CO7	Write down spoilage of canned products, biochemical, enzymatic and microbial spoilage
<b>Course Code: Pl. Path-301 Course Title: Disease of field &amp; horticultural crops and their management-II</b>	<b>Outcomes</b>
CO1	Write down economic importance, symptoms, cause, disease cycle and integrated management of diseases of fruits
CO2	Write down economic importance, symptoms, cause, disease cycle and integrated management of diseases of vegetable.
CO3	Write down economic Importance, symptoms, cause, disease cycle and integrated management of diseases of cucurbits
CO4	Study integrated management of diseases of maize, wheat
CO5	Study management of diseases of sugarcane, turmeric, tobacco
<b>Course Code: PCS-302 Course Title: Protected cultivation and Secondary Agriculture</b>	<b>Outcomes</b>
CO1	Describe greenhouse technology, introduction, types of greenhouses
CO2	Write greenhouse equipment, materials of construction for traditional and low-cost green houses
CO3	Describe cost estimation and economic analysis. Choice of crops for cultivation under greenhouses
CO4	Write Growing media, soil culture, type of soil required, drainage, flooding and leaching
CO5	Describe Threshing, threshers for different crops, parts, terminology, care and maintenance

CO6	Identify drying, grain drying, types of drying, types of dryers. Storage
CO7	Write Grading, methods of grading, equipment for grading of fruits and vegetables
<b>Course code: Ent-302; Course title: Management of Beneficial Insects</b>	<b>Outcomes</b>
CO1	Study Insect ecology: Introduction, environment and its components
CO2	Understand concepts of balance of life in nature
CO3	Study IPM; Introduction, importance, concepts principles
CO4	Identify biological methods of control (parasites, predators
CO5	Study of important insecticides
CO6	Study recent methods of pest control, repellents
CO7	Identify beneficial insects: parasites and predators used in pest control
<b>Course Outcomes</b>	<b>Courses offered in Semester VII</b>
	<b>Rural Agricultural Work Experience (RAWE)</b>
<b>Course Title: Village attachment</b>	<b>Outcomes</b>
CO1	Work with villagers
CO2	Solve the problem of villagers
CO3	Soil testing of farmer field
CO4	Identification of disease and insect pest on farmer field
CO5	Suggestions to the farmer about human health
CO6	Suggestions to the farmer about child education and development
<b>Course Title: Experiential learning</b>	<b>Outcomes</b>
CO1	Practical on seed production at farm
CO2	Practical of food processing
CO3	Practical on disease identification and management
CO4	Practical on insect identification and management
CO5	Practical on mushroom cultivation
CO6	Practical on Post harvest technology
CO7	Practical on biofertilizer and biopesticides
<b>Course Title: Industry attachment/KVK/Research Station</b>	<b>Outcomes</b>
CO1	Visit to nearby industry/KVK/Research station
CO2	Learning the work culture of industry/KVK/Research station
CO3	Discussion with the workers
CO4	Identification the procedure of production.
	<b>0 Tutorial period of one hour per week over a semester</b>
	<b>4 Practical period of four hour per week over a semester</b>

<b>Course Code: -----, Course Title Project report preparation and examination</b>	<b>Outcomes</b>
CO1	Daily dairy preparation
CO2	Compilation of all programmes during semester
CO3	Presentation of the report
CO4	Submission of the report
<b>Course Outcomes</b>	<b>Courses offered in Semester VIII</b>
	<b>Rural Entrepreneurship Awareness development Yojana (READY)</b>
<b>Course Code: READY-401 Course Title: Production Technology for Bioagents and Biofertilizers</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different bioagents and biofertilizers and their applications in agriculture
<b>Course Code: READY-402 Course Title: Seed Production and Technology</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different seed production stratifies and quality improvement of seeds for crop improvement.
<b>Course Code: READY-403 Course Title: Mushroom cultivation and Technology</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about mushroom cultivation and the technology to improve the quality.
<b>Course Code: READY-404 Course Title: Soil, Plant, Water and Seed Testing</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different protocols for testing water, seed and Soil of different types.
<b>Course Code: READY-405 Course Title: Commercial Beekeeping</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different aspects of Beekeeping
<b>Course Code: READY-406 Course Title: Poultry Production Technology</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different aspects Poultry production
<b>Course Code: READY-407</b>	<b>Outcomes</b>

<b>Course Title: Commercial Horticulture</b>	
CO1	Hands on practice and knowledge horticultural tools and techniques for different horticultural crops.
<b>Course Code: READY-408 Course Title: Floriculture and Landscaping</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different floricultural methods and landscaping architecture.
<b>Course Code: READY-409 Course Title: Food Processing</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different methods of food processing, tools and techniques.
<b>Course Code: READY-410 Course Title: Agriculture Waste Management</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about eradication and utilization of agriculture waste and its management.
<b>Course Code: READY-411 Course Title: Organic Production Technology</b>	<b>Outcomes</b>
CO1	Hands on practice and knowledge about different aspects of organic farming
<b>Course Code: READY-412 Course Title: Commercial Sericulture</b>	<b>Outcomes</b>
CO1	COI Hands on practice and knowledge about different aspects rearing silk worm and production of silk



## B. Tech. Food Technology

<b>B. Tech. Food Technology</b>	
<b>Programme outcomes</b>	This program enables the students to acquire comprehensive knowledge for identification, quantification, and characterization of appropriate food raw materials, processes, and products critical for sustaining life processes and also for industrial applications. They will get the ability to unravel basic principles and methods related to human food nutrition leading to individual and social well-being in a sustainable environment safety and ethics. Students will develop management and communication skills through teamwork and self-learning for healthy and sustainable food systems.
<b>Programme specific outcomes</b>	The student will be able to apply knowledge of food technology and allied disciplines which enable them to understand the emerging techniques and advanced food engineering concepts. Students will get the ability for solving engineering problems related to the modern food industry, food spoilage, and adulteration along with the focus on the importance of food safety and hygiene of nutritious processed foods. By the end of this course, students will be able to work in the domain of food processing, quality assurance, and quality control in private or government organizations and research laboratories to design or process food products as per the needs and specifications, or can also emerge as an entrepreneur.

### Course Outcomes

<b>B. Tech. 1<sup>st</sup> semester</b>	
<b>Courses</b>	<b>Outcomes</b>
<b>Professional communication skills (ENG-101)</b>	CO 1: To stimulate intellectual exercises and to develop communicative skills among students. CO 2: To guide them in becoming socially responsible citizens and balanced human beings. CO 3: To train learners in the art of communication through language exercises of both general and technical varieties.
<b>General Microbiology (MIC-101)</b>	CO 1: Illustration of the evolution and scope of microbiology; and history of microbiology.

	<p>CO 2: Introduction to bacteria, fungi, algae, and protozoa, and viruses.</p> <p>CO 3: To understand microbial genetics, bacterial recombination, bacterial conjugation, transduction, and bacterial transformation.</p> <p>CO 4: To learn the different types of mutations, mutagenesis, mutation rate, and repair of mutations.</p>
<b>Basic Mathematics-I (MATH-111)</b>	<p>CO 1: To illustrate the different aspects of mensuration.</p> <p>CO 2: To acquaint with algebra and solution of the quadratic equation.</p> <p>CO 3: To illustrate the different aspects of co-ordinate geometry.</p>
<b>Engineering Drawing and Graphics (EE-101)</b>	<p>CO 1: To know the first and third angle methods of projection, and preparation of working drawing from models.</p> <p>CO 2: To know the different methods of dimensioning and the concept of sectioning.</p> <p>CO 3: To understand the types of rivet heads and riveted joints.</p> <p>CO 4: To understand the different types of lock nuts, studs, machine screws, cap screws, and wood screws</p>
<b>Basics of Electronics Engineering (ETE-101)</b>	<p>CO 1: Introduction to a semiconductor diode, ideal diode,</p> <p>CO 2: Understanding of bipolar junction transistor, construction, transistor operations, and BJT characteristics</p> <p>CO 4: Understanding of small-signal amplifiers and feedback amplifiers.</p>
<b>Workshop Technology (EE-102)</b>	<p>CO 1: Introduction to basic materials such as ferrous and non-ferrous materials and important engineering materials</p> <p>CO 2: To learn the different aspects of measuring and gauging, welding, carpentry, machinery, and sheet metal</p>
<b>Fundamentals of Food Processing (FT-101)</b>	<p>CO 1: Causes and types of food spoilage, scope, and benefit of food preservation and methods of food preservation.</p> <p>CO 2: Preservation by heat treatment, drying, concentration, irradiation, and fermentation.</p> <p>CO 3: Illustration of advanced processing techniques such as pulsed electric field ultrasound, dielectric heating, ohmic and infrared heating, high-pressure processing, microwave processing.</p>
<b>Environmental Sciences &amp; Disaster Management (ENV-101)</b>	<p>CO 1: Introduction to environmental, ecology, and ecosystem.</p> <p>CO 2: Description of renewable and non-renewable resources and forest resources.</p> <p>CO 3: Description of environmental pollution – water, air, land, and noise pollution.</p>

<b>Physical Education (PHE-101)</b>	<p>CO 1: Description of physical training and health; test and measurement in physical education.</p> <p>CO 2: To learn the different aspects of circuit training, interval training, far trek training, pressure training, and resistance training.</p>
<b>B. Tech. 2<sup>nd</sup> semester</b>	
<b>Food Chemistry of Macronutrients (FC-101)</b>	<p>CO 1: Nature, scope, and development of food chemistry.</p> <p>CO 2: Develop an understanding of dispersed systems of foods, physicochemical aspects of food dispersion system (Sol, gel, foam, emulations).</p> <p>CO 3: Learning of chemistry of carbohydrates, proteins, and lipids.</p> <p>CO 4: Oil processing operations such as refining, hydrogenations, and inter esterification.</p>
<b>Food Microbiology (FT-102)</b>	<p>CO 1: Importance and significance of microbes in food science.</p> <p>CO 2: Learning of Intrinsic and extrinsic factors affecting the growth of microorganisms.</p> <p>CO 3: Sources of contamination in food and their prevention.</p> <p>CO 4: Microbiology of poultry, eggs, and canned foods and food-borne intoxications and infections.</p>
<b>Food Thermodynamics (FT-103)</b>	<p>CO 1: Learning of laws of thermodynamics</p> <p>CO 2: Learning of thermodynamic properties of pure substances in solid, liquid, and vapor phases, and psychometry:</p> <p>CO 3: Description of three stages of water, phase diagram for water, vapor pressure-temperature curve for water.</p> <p>CO 4: Description of properties of steam: wet, dry saturated, superheated steam, use of steam tables.</p>
<b>Fluid Mechanics (EE-103)</b>	<p>CO 1: Learning of flow behavior of viscous foods, compressible and non-compressible fluids and pressure measuring devices.</p> <p>CO 2: Introduction to reciprocating pumps and working of reciprocating pump.</p> <p>CO 3: Description of fluid flow: Classification, steady, uniform and non-uniform, laminar and turbulent, continuity equation.</p> <p>CO 4: Description of dimensional analysis: Buckingham's theorem, application to fluid flow phenomena, Froude number, Reynolds number, Weber number, and hydraulic similitude.</p>

<b>Basics of Electrical Engineering (ETE-102)</b>	CO 1: Learning of Circuit Analysis: Ohm's Law, KCL, KVL Mesh and Nodal Analysis. CO 2: Description of A.C. Circuits, Measuring Instruments, Transformers, AND Three Phase Circuits
<b>Basic Mathematics-II ()</b>	CO 1: Description of trigonometry, elementary calculus, differentiation of simple algebraic trigonometry, theorems on differentiation of the sum. CO 2: Description of Integration of the standard forms as the inverse of differentiation.
<b>Post-Harvest Engineering (FT-104)</b>	CO 1: Learning of post-harvest handling operations; cleaning, separation, drying, shelling, milling. CO 2: Description of materials handling: Introduction to different conveying equipment used for handling of grains, fruits, and vegetables. CO 3: Learning of conveyers, belt conveyor, chain conveyors, screw conveyors, pneumatic conveyers.
<b>Statistics (STAT-102)</b>	CO 1: Definition of statistics and its use and limitations, frequency distribution, and frequency curves. CO 2: Introduction to sampling: random sampling; the concept of standard error; tests of significance- types of errors, the null hypothesis. CO 3: Description of Small sample test for means, student's t-test for a single sample, two samples, and paired t-test. F test; Chi-Square test and Linear regression.
<b>NCC/NSS (PHE-102)</b>	CO 1: Orientation of students towards national problems. CO 3: Study of the philosophy of N.S.S., fundamental rights, directive principles of state policy, the socio-economic structure of Indian society.
<b>B. Tech. 3<sup>rd</sup> semester</b>	
<b>Crop Production Technology ( FT-201)</b>	CO 1: Classification of crops, crop production technology for major cereal crops viz., paddy, wheat, maize, pearl millet, sorghum. CO 2: Description of crop production technology for major pulse crops viz., mango, banana, sapota, amla, pomegranate, guava pigeon pea, cowpea, gram, green gram, black gram. CO 3: Description of crop production technology for major fruits and vegetable crops viz., potato, onion, tomato, chili, and other green and leafy vegetables.
<b>Processing Technology of Liquid Milk ( FT-202)</b>	CO 1: Historical development of dairy in India; production and utilization of milk

	<p>CO 2: Learning of production technology for cream, fermented milk products,</p> <p>CO 3: Description of adulterations in milk and its detection</p> <p>CO 4: Description of milk reception equipment, milk tanks/silos, pasteurizers, sterilizers, centrifuges, clarifiers, filtration units, homogenizers, packaging, and filling machines</p>
<b>Processing Technology of Cereals ( FT-203)</b>	<p>CO 1: Present status and prospects of cereals and millets.</p> <p>CO 2: Description of paddy processing and rice milling, parboiling, and milling of wheat milling, corn, Barley, oat, sorghum.</p> <p>CO 3: Description of by-products processing of cereals and millets and processing of infant foods from cereals and millets.</p>
<b>Industrial Microbiology ( FT-204)</b>	<p>CO 1: History of industrial microbiology; primary and secondary metabolites produced by the microorganisms.</p> <p>CO 2: Description of fermenter, components, and types of the fermenter.</p> <p>CO 3: Description of probiotics, importance, role in fermented foods, organisms involved beneficial effects.</p> <p>CO 4: Description of cell disruption methods: mechanical disruption methods and non-mechanical disruption methods.</p>
<b>Food Chemistry of Micronutrients ( FT-205)</b>	<p>CO 1: Learning of Chemistry of food flavor, sensory assessment of flavor, technology for flavor retention.</p> <p>CO 2: Description of Pigments in animal and plants kingdoms, vitamins and minerals.</p> <p>CO 3: Description of chemistry of anti-nutritional factors. Enzymes in the food industry.</p>
<b>Heat and Mass Transfer in Food Processing ( FT-206)</b>	<p>CO 1: Description of Basic heat transfer processes, heat transfer coefficients, properties related to heat transfer.</p> <p>CO 2: Description of One-dimensional steady-state heat conduction with heat generation.</p> <p>CO 3: Introduction to unsteady-state heat conduction, system with negligible internal resistance and in various geometries.</p> <p>CO 4: Learning of heat transfer to flowing fluids, application of different types of heat exchangers in dairy and food industry.</p>
<b>Unit Operations in Food Processing-I (FT-207)</b>	<p>CO 1: Size reduction equipment, attrition mills, buhr mill, tumbling mills, tumbling mills, ultra-fine grinders.</p> <p>CO 2: Description of mixers for low- or medium-viscosity liquids, paddle agitators, impeller agitators, powder-liquid contacting devices, other mixers.</p>

	CO 3: Description of mechanical separations, filtration, and membrane separation.
<b>Computer Programming and Data Structures (CSE-221)</b>	<p>CO 1: Review of computer technology; processor, memory, secondary storage, display devices, and other peripheral devices.</p> <p>CO 2: Description of algorithms and flow-charts, role of the compiler and the integrated development environment, and control structures.</p> <p>CO 3: Use of function prototypes, structures, unions, and user-defined types.</p> <p>CO 4: Description of primary data types and user-defined data types, variables, typecasting, operators, building and evaluating expressions.</p>
<b>B. Tech. 4<sup>th</sup> semester</b>	
<b>Processing Technology of Dairy Products (FT-209)</b>	<p>CO 1: Processing technology of butter, ghee, ice cream, and frozen desserts.</p> <p>CO 2: Description of processing technology of condensed and dried milk, traditional dairy products.</p> <p>CO 3: Description of by-products of the dairy industry and their utilization.</p>
<b>Processing Technology of Legumes and Oilseeds (FT-210)</b>	<p>CO 1: Classification and types of legumes and oilseeds;</p> <p>CO 2: Description of chemical composition, nutritional value, and anti-nutritional compounds in legumes and oilseeds</p> <p>CO 3: Description of nutritional changes during soaking and sprouting of pulses</p> <p>CO 4: Learning of oilseed milling: Ghani's, hydraulic presses, expellers, solvent extraction methods, refining and hydrogenation of oils</p>
<b>Food Biochemistry and Nutrition (FT-211)</b>	<p>CO 1: Learning of biochemistry of carbohydrates, lipids, proteins, vitamins, and minerals.</p> <p>CO 2: Formulation of diets, classification of a balanced diet, preparation of balanced diet for various groups, recommended dietary allowances.</p> <p>CO 3: Description of mechanism of enzyme action, metabolism of lipids, proteins, minerals.</p>
<b>Unit Operations in Food Processing-II (FT-212)</b>	CO 1: Principles of evaporation, mass and energy balance, factors affecting rate of evaporation, thermodynamics of evaporation.



	<p>CO 2: Description of food freezing, freezing point curve for food and water, common food materials.</p> <p>CO 3: Principles of food freezing, freezing time calculation by using Plank's equation.</p> <p>CO 4: Description of expression, extraction, sterilization, and roasting.</p>
<b>Food Biotechnology (FT-213)</b>	<p>CO 1: Chemical nature, properties, and functions of the genetic material.</p> <p>CO 2: Organization of the genetic material in bacteria, eukaryotes, and viruses.</p> <p>CO 3: Description of Transcription and translation, recombinant DNA technology, Ethical issues concerning GM foods.</p> <p>CO 4: Classification of biosensors, application of biosensors, application of biotechnology in food.</p>
<b>Food Refrigeration and Cold Chain (FT-214)</b>	<p>CO 1: Principles of refrigeration, vapor refrigeration, and vapor-absorption refrigeration system.</p> <p>CO 2: Description of cold store, design of cold storage for different categories of food resources.</p> <p>CO 3: Meaning of air-conditioning and factors affecting comfort air-conditioning, classification, sensible heat factor, industrial air-conditioning.</p>
<b>Processing of Spices and Plantation Crops (FT-215)</b>	<p>CO 1: Production and processing scenario of spice, flavor, and plantation crops.</p> <p>CO 2: Description of minor spices: herbs, leaves, and Spartan seasonings and their processing and utilization.</p> <p>CO 3: Learning of post-harvest technology for Tea, coffee, cocoa; Vanilla, and annatto processing.</p> <p>CO 4: Learning of post-harvest technology and processing of areca nut, cashew nut, oil palm</p>
<b>Business Management and Economics (BM-201)</b>	<p>CO 1: Learning of management principles, scientific principles, and administrative principles.</p> <p>CO 2: Description of human resource management, objectives of manpower planning, process, sources of recruitment, the process of selection.</p> <p>CO 3: Learning of finance management: definition, scope, objective; different systems of accounting, Financial accounting, cost accounting, management accounting.</p>
<b>B. Tech. 5<sup>th</sup> semester</b>	

<b>Processing Technology of Fruits and Vegetables (FT-301)</b>	<p>CO 1: Production and processing scenario of fruits and vegetables in India and the world.</p> <p>CO 2: Description of canning, processing steps, and equipment, quality assurance, and defects in canned products.</p> <p>CO 3: Description of FSSAI specifications and preparation and preservation of juices, squashes, syrups, sherbets, nectars, cordials.</p> <p>CO 4: Learning of commercial processing technology of selected fruits and vegetables for production of various value-added processed products.</p>
<b>Processing of Meat and Poultry Products (FT-302)</b>	<p>CO 1: Sources and importance of meat and poultry; Status of Meat and poultry industry in India.</p> <p>CO 2: Description of preservation of meat by chilling, freezing, pickling, curing, cooking, and smoking.</p> <p>CO 3: Learning of preparation, packaging, and equipment for the manufacture of dehydrated meat products and their quality evaluation</p> <p>CO 4: Description of structure, composition, quality characteristics, processing, preservation of eggs.</p>
<b>Instrumental Techniques in Food Analysis (FT-303)</b>	<p>CO 1: Concepts of food analysis; rules and regulations of food analysis; principles and methodology involved in the analysis of foods.</p> <p>CO 2: Description of chromatography: adsorption, column, partition, gel-filtration, affinity, ion-exchange, size-exclusion method, gas-liquid, high-performance liquid chromatography.</p> <p>CO 3: Learning of Instrumentation and sensors for the food industry, rapid microbiological methods, and chemically sensitive semiconductor devices.</p>
<b>ICT Applications in Food Industry (FT-304)</b>	<p>CO 1: Importance of computerization in the food industry, operating environments, and information systems for various types of food industries.</p> <p>CO 2: Introduction to MATLAB, Basic commands, computing with MATLAB.</p> <p>CO 3: Learning of automation in the Food industry, mechanization, and automation, classification of automation systems.</p> <p>CO 4: Introduction to computational fluid dynamics (CFD), governing equations of fluid dynamics, models of flow.</p>

<b>Food Process Equipment Design (FT-305)</b>	<p>CO 1: Description of materials for fabrication, mechanical properties, ductility, hardness, corrosion, protective coatings, corrosion prevention linings equipment.</p> <p>CO 2: Description of Design of pressure and storage vessels, agitators and separators, dryers, and extruders.</p>
<b>Food Storage Engineering (FT-306)</b>	<p>CO 1: Importance of scientific storage systems, post-harvest physiology of semi-perishables and perishables, climacteric and non-climacteric fruits.</p> <p>CO 2: Description of traditional storage structures, improved storage structures, modern storage structures.</p> <p>CO 3: Description of aeration and stored grain management, storage of perishables, functional and structural design of grain storage structures.</p>
<b>Bakery, Confectionery and Snack Products (FT-307)</b>	<p>CO 1: Types, specifications, compositions, ingredients, formulations, processing, equipment for bakery products.</p> <p>CO 2: Types, specifications, compositions, ingredients, formulations, processing, equipment, packaging, storage, and quality testing of confectionery and chocolate products.</p> <p>CO 3: Description of snack foods and breakfast cereals, macaroni products, and malts, types, specifications, compositions, ingredients, formulations, processing.</p>
<b>Marketing Management and International Trade (BM-301)</b>	<p>CO 1: Concept, functions, scope, and marketing management Market measurement, market forecasting, market segmentation, targeting, and positioning.</p> <p>CO 2: Learning of advertising, objectives, budget, and advertising message, media planning, personal selling, and publicity.</p> <p>CO 3: Description of direct exports, indirect exports, licensing, joint ventures, direct investment, and internationalization process, distribution channels.</p>
<b>B. Tech. 6<sup>th</sup> semester</b>	
<b>Processing Technology of Beverages (FT-308)</b>	<p>CO 1: History and importance of beverages and status of the beverage industry</p> <p>CO 2: Description of Low-calorie and dry beverages, isotonic and sports drinks, dairy-based beverages</p> <p>CO 3: Description of FSSAI specifications for beverages, Sweeteners, colorants, acidulants, clouding and clarifying and flavoring agents for beverages.</p>

<b>Food Plant Sanitation (FT-309)</b>	<p>CO 1: Good manufacturing practices, current good manufacturing practices; standard operating procedures, good laboratory practices, sanitation.</p> <p>CO 2: Learning of personal hygiene and sanitary food handling and pest control.</p> <p>CO 3: Learning of dairy processing plant sanitation, seafood plant sanitation, and beverage plant sanitation.</p>
<b>Food Packaging Technology and Equipment (FT-310)</b>	<p>CO 1: Need of packaging, package requirements, and package functions.</p> <p>CO 2: Description of package materials and their classification.</p> <p>CO 3: Description of lamination, molding-injection, blow, extrusion, and coating on paper and films.</p> <p>CO 4: Learning of permeability of gases and vapors; Permeability of multilayer materials; Permeability in relation to packaging requirement of foods.</p>
<b>Processing of Fish and Marine Products (FT-311)</b>	<p>CO 1: Types of fish and other marine products, classification of fish (fresh water and marine).</p> <p>CO 2: Principles of canning, the effect of heat processing on fish, storage of canned fish.</p> <p>CO 3: Description of fish protein concentrates (FPC), fish protein extracts (FPE).</p> <p>CO 4: Description of oxygen absorbents and CO<sub>2</sub> generators, ethanol vapor generation, hurdle barrier concept.</p>
<b>Sensory Evaluation of Food Products (FT-312)</b>	<p>CO 1: Introduction, definition, and importance of sensory evaluation in relation to consumer acceptability and economic aspects.</p> <p>CO 2: Learning of basic principles, senses and sensory perception, physiology of sensory organs, classification of tastes and odors.</p> <p>CO 3: Description of panel selection, screening, and training of judges, requirements of sensory evaluation.</p> <p>CO 4: Learning of Interrelationship between sensory properties of food products and various instrumental and physicochemical tests.</p>
<b>Food Additives and Preservatives (FT-313)</b>	<p>CO 1: Intentional and unintentional food additives, their toxicology and safety evaluation.</p> <p>CO 2: Regulatory aspects of dyes, food color (natural and artificial), pigments, and their importance.</p>

	CO 3: Description of Humectants/polyhydric alcohol, anticaking agent, firming agent, flour bleaching and maturing agents, antioxidants, nutritional and non-nutritional sweeteners.
<b>Food Quality, Safety Standards, and Certification (FT-314)</b>	CO 1: Food quality its definition and its role in the food industry. CO 2: Description of pathological and entomological defects. CO 2: Description of laboratory quality measurement, consumer measurement, and limitations of the consumer survey.
<b>Instrumentation and Process Control in Food Industry (FT-315)</b>	CO 1: Learning of the static and dynamic characteristics, temperature and temperature scales, various types of thermometers, thermocouples, resistance thermometers, and pyrometers. CO 2: Learning of kinds of flow, rate of flow, total flow differential pressure meters, variable area meters, food flow metering. CO 3: Description of transmission, transducer, computer-based monitoring, and control.
<b>Project Preparation and Management (BM-302)</b>	CO 1: Functions and viewpoints of management, the evolution of project management, forms and environment of project management. CO 1: Learning of project identification and screening, project appraisal, project charter and project proposal. CO 1: Description of project planning and scheduling, project cost estimation, project implementation, monitoring and control, and project completion and future directions.
<b>B. Tech. 7<sup>th</sup> semester</b>	
<b>Communication Skills and Personality Development (ENL-401)</b>	CO 1: Description of structural and functional grammar. CO 2: Description of communication, verbal and nonverbal communication. CO 3: Learning of Oral presentation skills, public speaking; group discussion sentence patterns in English.
<b>Entrepreneurship Development (BM-403)</b>	CO 1: Importance and growth, characteristics and qualities of an entrepreneur, the role of entrepreneurship. CO 1: Concept of entrepreneurship, entrepreneurial and managerial characteristics, managing an enterprise. CO 1: Learning of corporate entrepreneurship; role, mobility of entrepreneur; entrepreneurial motivation.

	CO 1: Description of Government schemes and incentives for promotion of entrepreneurship.
<b>Student READY - Experiential Learning Program - I (EXPL-401)</b>	CO 1: Experiential Learning is intended to build practical skills and entrepreneurship attributes among the students to deal with work situations and for better employability and self-employment. CO 2: To develop the detailed Project Report on setting up of an enterprise in the selected areas of product manufacture and evaluation of the module.
<b>Student READY - Research Project (RP-401)</b>	CO 1: To investigate selected problems of special interests in Food Processing Technology to the individual student. CO 2: The work includes library work, field or laboratory research, recording data, analyzing data and writing of report.
<b>Student READY - Seminar 1 (FT-500)</b>	CO 1: To develop presentation skills among students CO 1: Presentation and discussion by each student on current topics/interests in Food Processing Technology
<b>B. Tech. 8<sup>th</sup> semester</b>	
<b>Student READY - Industrial Tour (INDT-401)</b>	CO 1: Educational tour of two three weeks to various industries within and outside the state of the university CO 2: To develop Writing skills among students and submission reports on Industrial tour.
<b>Student READY - Internship/In-Plant Training (INDT-402)</b>	CO 1: In-plant Training is intended to expose the students to an environment in which they are expected to be associated in their future careers. CO 2: The students will gain hands-on experience in one or more commercial establishments.





## PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES

### M.Sc. Agronomy

<b>Program Outcomes</b>	In this program students learn about different kinds of crop production practices, their management as well as their interaction with allied sectors of agriculture. Student can work in Government Sector specially in Agriculture Department and different private sectors viz, pesticide companies, fertilizer companies, seed also in seed production sectors.
<b>Program Specific Outcomes</b>	Students learn about different cropping (oil seeds, fibers, legumes, cereals etc.) as well as farming system (IFS, organic farming, conservation farming etc.) and their modern concepts and principles.
<b>Course</b>	<b>Outcomes</b>
Crop production	It provides modern concept of crop production with specialization of cereals, pulses, oilseeds, tubers, medicinal, aromatic and under-utilized crops.
Soil management	In this program student learn about soil mineralogy, genesis, classification, survey as well as management of problematic soils. It also deals with soil fertility and nutrient management practices.
Organic farming	It provides a wide knowledge about different kind of organic manures and their efficient utilization in various cropping systems.
Weed management	It enables the students to attain knowledge on basic principles and modern practices of weed management.
Water management	To tech the students about principles of water management of the crops and cropping systems, practices to enhance the water use efficiency.

## COURSE OUTCOMES

Course	Course Outcomes
<b>M.Sc. Agronomy 1<sup>st</sup> Semester</b>	
AGRON-501	Student learn about modern concept concepts, scientific principles of crop production, quantitative agro-biological principles and modern concept of tillage.
AGRON-503	Understand the weed biology and ecology, herbicide classification, mode and mechanism of action of herbicides and integrated weed management in different crops.
AGRON-513	Enhance the student skill for organic farming, socio-economic impact, export potential of organic farming, control of weeds, diseases and other pest in organic farming.
<b>M.Sc. Agronomy 2<sup>nd</sup> Semester</b>	
AGRON-502	Familiarize with preparation and use of organic manures and biofertilizers, commercial fertilizers, time and methods of manures and fertilizer application in respect to soil fertility and productivity.
AGRON-508	Ability to understand the importance of medicinal and aromatic plants in human health, classification of these plants and climate, soil requirements, cultural practices, yield and important constituents of medicinal and aromatic plants.
<b>M.Sc. Agronomy 3<sup>rd</sup> Semester</b>	
AGRON-504	Develop an understanding of water and its role in plants, water resources and major irrigation project of India and water management in different crops and cropping system.
AGRON-506	Student learn about origin, history, area, production, classification, varieties, climate, soil, water and cultural requirement of rabi and kharif season crops.

## PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES

### Ph.D. Agronomy

<b>Program Outcomes</b>	In this program students learn about different modern trends in agronomy, crop ecology, crop production and system modeling, crop growth and productivity, irrigation management, soil conservation and watershed management, interested farming systems for sustainable agriculture and advance techniques of weed management.
<b>Program Specific Outcomes</b>	Students learn about modern techniques of weed, watershed and irrigation management with special reference to advance trends in agronomy and crop ecology.
<b>Course</b>	<b>Outcomes</b>
Crop growth and productivity	Learning of globalization of agriculture and WTO, different methods of farming, GIS, GPS, and remote sensing, GM crops and global warming, elementary model for growth and elementary model for crop growth, concept of crop ecology, ecosystem types and function.
Irrigation management	Develop an understanding of water resources of India, irrigation projects, soil plant water relationship and land suitability for irrigation.
Weed management	It enables the students to attain knowledge about physiological and biological aspects of herbicides and their mode of action and advancement in herbicide application methods.

## COURSE OUTCOMES

Course	Course Outcomes
<b>Ph. D. Agronomy 1<sup>st</sup> Semester</b>	
AGRON-601	Understand the crop residue management in multiple cropping system, latest development in in plant management, export potential of organic products, sustainable agriculture and research methodology in Agronomy.
AGRON-602	Enhance the student skill for physiological response of crop plants, succession and climax concept, principles of plant distribution and adaption, crop and world food supply and exploitation of solar energy in crops.
AGRON-603	Student learn about system classification, modeling techniques and method of irrigation, elementary models for crop growth, dry mater production and distribution in different crops.
<b>Ph.D. Agronomy 2<sup>nd</sup> Semester</b>	
AGRON-604	Familiarize with plant density and crop production, physiological limitation for crop yield, growth analysis (CGR, RGR, NAR, LAI, LAD, LAR) growth curve, principles involved in inter and mixed cropping, competitive relationship and competition functions and concept of plant ideotype.
AGRON-605	Ability to understand the water resources of India, irrigation projects, soil plant water relationship, water movement in soil, application of irrigation water and land suitability for irrigation.
AGRON-606	Understand the crop weed competition in different cropping systems, physiological and biological aspects of herbicide, development of transgenic herbicide resistant crops and relationship of herbicide with different interculture operations.

**PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES**  
**M.Sc. Ag. Entomology**

Programme outcome	Entomologists commonly work with Plant Breeders, Farmers, Agronomists, Horticulturists, Pathologists etc. in the fields, farms and gardens wherever plants grow. Additionally, Entomologists engage with biological scientists and engineers to create safer living arrangements and achieve high yield and potential boost to the Indian agriculture economy.
Programme specific outcome	<p>Expertise in the identification, life history and ecology of insect pests and predators/ parasites as well as the basic principles and strategies of their management.</p> <p>Aspirants of Entomology, comprises with the basic knowledge and technologies used in Apiculture, Nematology, Sericulture, Biological control Toxicology, Economic Entomology etc. Interdisciplinary research work is also being carried out, with the different departments like Plant Pathology, Biochemistry, Molecular biology, Soil science, Horticulture, Agronomy etc.</p> <p>The knowledge acquired and skill developed in the field of entomology, help in recognizing the applications of latest technologies in all spheres of agriculture and develop crops with improved productivity thereby increasing farmers' income, better human health and decreased environmental pollution as well as meet out the future challenges in agricultural crops and storage grains.</p>
<b>Course</b>	<b>Course Outcomes (COs)</b>
<b>M.Sc. Ag. Entomology 1<sup>st</sup> Sem.</b>	
<b>Major</b>	
<b>Insect Morphology (ENT 501)</b>	<p>CO 1: Concepts of insect morphology their principles, utility and relevance</p> <p>CO2: Description of head- origin, structure and modification; types of mouthparts and antennae.</p> <p>CO3: Description of Thorax- Areas and sutures. Wings: structure and modifications, wing coupling apparatus and mechanism of flight. Legs: structure and modifications.</p> <p>CO 4: Description of abdomen- Segmentation and appendages; Genitalia and their modifications; Embryonic and post-embryonic development; Types of metamorphosis. Insect sense organs.</p>
<b>Insect Anatomy, Physiology and Nutrition (ENT 502)</b>	<p>CO 1: Understand the scope and importance of insect anatomy and physiology.</p> <p>CO 2: Described structure, modification and physiology of different systems.</p> <p>CO 3: The concept of thermodynamics; physiology of integument, moulting; growth, metamorphosis and diapause.</p> <p>CO4: Insect nutrition- role of vitamins, proteins, amino acids, carbohydrates, lipids, minerals and other food constituents.</p> <p>CO 5: Extra and intra-cellular microorganisms and their role in physiology; artificial diets.</p>



<b>Classification of Insects (ENT 504)</b>	CO 1: Describes brief evolutionary history of Insects- introduction to phylogeny of insects and Major Classification of Superclass Hexapoda CO 2: Identification of classes by distinguishing characters, general biology. CO 3: Described habits, habitats and distinguishing characteristics of insect falling in different orders and economically important families contained in them.
<b>Biological Control of Crop Pests and Weeds (ENT 507)</b>	CO 1: Describes history, principles and scope of biological control; important groups of parasitoids, predators and pathogens. CO 2: Biology, adaptation, host seeking behaviour of predatory and parasitic groups of insects. CO 3: Role of insect pathogenic nematodes, viruses, bacteria, fungi, protozoa etc., their mode of action. CO 4: Biological control of weeds using insects. CO 5: Mass production of quality biocontrol agents- techniques, formulations, economics, field release/application and evaluation.
Minors	
<b>Principles of Plant Pathology (PL PATH 504)</b>	CO 1: Describe in detail definitions, concept, history of plant disease. Provide basic understanding about biotic and abiotic factors and causes of plant disease CO 2: Develop an understanding about growth, reproduction and role of environment in plant diseases CO 3: Enumerate and explain recognition concept and infection, symptomatology, disease development- role of enzymes, toxins, growth regulators; defense strategies- oxidative burst; Phenolics, Phytoalexins, PR proteins, Elicitors. Altered plant metabolism as affected by plant pathogens CO4: Develop an understanding about genetics of resistance; 'R' genes; mechanism of genetic variation in pathogens; molecular basis for resistance; marker-assisted selection; genetic engineering for disease resistance. CO 5: Explain in detail different plant management strategies
<b>Compulsory Non-Creditable Courses</b>	
<b>Library and Information Services (PGS 501)</b>	CO 1: Explains introduction to library and its services; Role of libraries in education, research and technology transfer. CO 2: Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography. CO 3: Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; e-resources access methods.
<b>Technical Writing and Communication Skills</b>	CO 1: Various forms of scientific writings- theses, technical papers, reviews, manuals, etc; Various parts of thesis and research

<b>(PGS 502)</b>	<p>communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion).</p> <p>CO 2: Grammar (Tenses, parts of speech, clauses, punctuation marks); Error analysis (Common errors); Concord; Collocation; Phonetic symbols and transcription.</p> <p>CO 3: Accentual pattern: Weak forms in connected speech: Participation in group discussion: Facing an interview; presentation of scientific papers.</p>
<b>M.Sc. Ag. Entomology, 2<sup>nd</sup>Sem.</b>	
<b>Major</b>	
<b>Insect Ecology (ENT 505)</b>	<p>CO 1: Concepts of insect morphology their principles, utility and relevance</p> <p>CO2: Description of head- origin, structure and modification; types of mouthparts and antennae.</p> <p>CO3: Description of Thorax- Areas and sutures. Wings: structure and modifications, wing coupling apparatus and mechanism of flight. Legs: structure and modifications.</p> <p>CO4: Description of abdomen- Segmentation and appendages; Genitalia and their modifications; Embryonic and post-embryonic development; Types of metamorphosis. Insect sense organs.</p>
<b>Toxicology of Insecticides (ENT 508)</b>	<p>CO 1: Describe the definition and scope of insecticide toxicology; history of chemical control; pesticide use and pesticide industry in India.</p> <p>CO 2: Classification of insecticides and acaricides based on mode of entry, mode of action and chemical nature. Structure and mode of action of insect growth regulators, microbials, botanicals, new promising compounds, etc.</p> <p>CO 3: Describes principles of toxicology; evaluation of insecticide toxicity; joint action of insecticides- synergism, potentiation and antagonism; factors affecting toxicity of insecticides; insecticide compatibility, selectivity and phytotoxicity.</p> <p>CO 4: Insecticide metabolism; pest resistance to insecticides; mechanisms and types of resistance; insecticide resistance management and pest resurgence.</p> <p>CO5: Insecticide residues, their significance and environmental implications.</p> <p>CO 6: Insecticide Act, registration and quality control of insecticides; safe use of insecticides; diagnosis and treatment of insecticide poisoning.</p>
<b>Pests of Horticultural and Plantation Crops (ENT 512)</b>	<p>CO 1: Description of fruit Crops- mango, guava, banana, jack, papaya, pomegranate, litchi, grapes, ber, fig, citrus, aonla, pineapple, apple, peach and other temperate fruits.</p> <p>CO 2: Description of vegetable crops- tomato, potato, radish, carrot, beetroot, cole crops, French beans, chow-chow, brinjal, okra, all gourds, gherkin, drumstick, leafy vegetables etc.</p> <p>CO 3: Description of plantation crop- coffee, tea, rubber, coconut, arecanut, cashew, cocoa etc.; Spices and Condiments- pepper, cardamom, clove, nutmeg, chillies, turmeric, ginger, beetlevine etc.</p> <p>CO 4: Description of ornamental, medicinal and aromatic plants and pests</p>

	in polyhouses/protected cultivation.
<b>Minor</b>	
<b>Principles of Plant Disease Management (PL PATH 506)</b>	<p><b>CO 1:</b> Explain the principles of plant disease management by cultural, physical, biological, chemical, organic amendments and botanicals methods of plant disease control, integrated control measures of plant diseases.</p> <p><b>CO 2:</b> Describe the disease resistance and molecular approach for disease management.</p> <p><b>CO 3:</b> Describe the foliage, seed and soil application of chemicals, role of stickers, spreaders and other adjuvants, health vis-a-vis environmental hazards, residual effects and safety measures</p> <p><b>CO 4:</b> Understanding of history of fungicides, bactericides, antibiotics, concepts of pathogen, immobilization, chemical protection and chemotherapy, nature, properties and mode of action of antifungal, antibacterial and antiviral chemicals</p>
<b>Supporting course</b>	
<b>Experimental Designs (STAT 512)</b>	<p><b>CO 1:</b> understand various uniformity trials, size and shape of plots and blocks; Analysis of variance; Completely randomized design, randomized block design and Latin square design. Split plot and strip plot designs; Analysis of covariance and missing plot techniques in randomized block and Latin square designs.</p> <p><b>CO 2:</b> Transformations, crossover designs, balanced incomplete block design, resolvable designs and their applications</p> <p><b>CO 3:</b> Lattice design, alpha design - concepts, randomisation procedure, analysis and interpretation of results.</p> <p><b>CO 4:</b> Response surfaces. Experiments with mixtures.</p>
<b>Compulsory Non-Creditable Courses</b>	
<b>Intellectual Property and Its Management in Agriculture (PGS 503)</b>	<p><b>CO 1:</b> Understand historical perspectives and need for the introduction of Intellectual Property Right regime;</p> <p><b>CO 2:</b> Describes the TRIPs and various provisions in TRIPs Agreement;</p> <p><b>CO 3:</b> Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs; Indian Legislations for the protection of various types of Intellectual Properties; Treaty on Plant Genetic Resources for Food and Agriculture.</p> <p><b>CO 4:</b> Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement.</p>
<b>Basic Concepts in Laboratory Techniques (PGS 504)</b>	<p><b>CO 1:</b> Describes about safety measures while in Lab; Handling of <b>chemical</b> substances; Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccumets; washing, drying and sterilization of glassware; Drying of solvents/ chemicals.</p> <p><b>CO 2:</b> Weighing and preparation of solutions of different strengths and their dilution; Handling techniques of solutions; Preparation of different agrochemical doses in field and pot applications; Preparation of solutions of acids; Neutralization of acid and bases; Preparation of buffers of different strengths and pH values.</p> <p><b>CO 3:</b> Use and handling of microscope, laminar flow, vacuum pumps, viscometer.</p>

<b>M.Sc. Ag. Entomology, 3<sup>rd</sup> Sem.</b>	
<b>Major</b>	
<b>Principles of Integrated Pest Management (ENT 510)</b>	<p>CO 1: The concept and philosophy, ecological principles, economic threshold etc are understood for consideration of economic management strategy.</p> <p>CO2: Describe political, social and legal implications of IPM; pest risk analysis; pesticide risk analysis; cost-benefit ratios and partial budgeting; case studies of successful IPM programmes.</p> <p>CO3: Explained about the tools of pest management and their integration- legislative, cultural, physical and mechanical methods; pest survey and surveillance, forecasting, types of surveys including remote sensing methods, factors affecting surveys.</p>
<b>Techniques in Plant Protection (ENT 518)</b>	<p>CO 1: Pest control equipments, principles, operation, maintenance, selection.</p> <p>CO2: Methods of pesticides and biocontrol agent's application: seed dressing, soaking, root-dip treatment, dusting, spraying, application through irrigation water.</p> <p>CO 3: Protein isolation from the pest and host plant and its quantification using spectrophotometer and molecular weight determination using SDS/ PAGE.</p> <p>CO 4: Use of computer application for predicting/ forecasting pest attack and identification.</p>
<b>Minor</b>	
<b>Integrated Disease Management (PL PATH-516)</b>	<p>CO 1: Describe the introduction, definition, concept and tools of disease management, components of integrated disease management- their limitations and implications.</p> <p>CO 2: Understanding the development of IDM- basic principles, biological, chemical and cultural disease management.</p> <p>CO 3: Understanding the IDM in important crops- rice, wheat, cotton, sugarcane, chickpea, rapeseed- mustard, pearl millet, <i>kharif</i> pulses, vegetable crops and fruit crops.</p>
<b>Supporting course</b>	
<b>Remote Sensing and Geographical Information System (SPG 503)</b>	<p>CO 1: Describes the use of aerial photography, satellite imagery and geographic information system for the collection, storage and spatial analysis for geo-reference.</p> <p>Co 2: Future prospects of remote sensing in India, software used in remote sensing, GIS versus remote sensing, Introduction to GIS software.</p>
<b>Compulsory Non-Creditable Courses</b>	
<b>Agriculture Research Ethics and Rural Development Programmes (PGS 505)</b>	<p>CO 1: understand history of agriculture in brief; Global agricultural research system: need, scope, opportunities.</p> <p>CO 2: Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions; Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centers (IARC), partnership with NARS, role as a partner in the global agricultural research system, strengthens the capacities at national and regional levels.</p> <p>CO 3: International fellowships for scientific mobility</p>

<b>Disaster Management (PGS 506)</b>	CO1: Explains about Disaster Management- Efforts to mitigate natural disasters at national and global levels. CO2: International Strategy for Disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, Community-based organizations, and media. CO3: Central, State, District and local Administration; Armed forces in Disaster response; Disaster response: Police and other organizations.
<b>M.Sc. Ag. Entomology, 4<sup>th</sup> Sem.</b>	
<b>Master's Research (ENT 599)</b>	CO 1: Identification of important pest problem of essential food and forage crops. CO 2: Minimizing the impact of those pests as major research objective, with emphasis on taxonomy, integrated management, toxicology etc.

# PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES

## Ph. D. Entomology

Programme outcome	Entomologists commonly work with Plant Breeders, Farmers, Agronomists, Horticulturists, Pathologists etc. in the fields, farms and gardens wherever plants grow. Additionally, Entomologists engage with biological scientists and engineers to create safer living arrangements and achieve high yield and potential boost to the Indian agriculture economy.
Programme specific outcome	Expertise in the identification, life history and ecology of insect pests and predators/ parasites as well as the basic principles and strategies of their management. Aspirants of Entomology, comprises with the basic knowledge and technologies used in Apiculture, Nematology, Sericulture, Biological control Toxicology, Economic Entomology etc. Interdisciplinary research work is also being carried out, with the different departments like Plant Pathology, Biochemistry, Molecular biology, Soil science, Horticulture, Agronomy etc. The knowledge acquired and skill developed in the field of entomology, help in recognizing the applications of latest technologies in all spheres of agriculture and develop crops with improved productivity thereby increasing farmers' income, better human health and decreased environmental pollution as well as meet out the future challenges in agricultural crops and storage grains.
<b>COURSE: Ph.D. Entomology</b>	<b>OUTCOMES</b>
<b>Ph.D. Entomology 1<sup>st</sup> Sem.</b>	
<b>Major</b>	
<b>Advanced Insect Systematics (ENT 601)</b>	CO 1: Familiarize the students with different schools of classification. CO2: Phylogenetics, classical and molecular methods, evolution of different groups of insects. CO 3: International Code of Zoological Nomenclature. CO 4: Ethics and procedure for taxonomic publications.
<b>Immature Stages of Insects (ENT 602)</b>	CO 1: Impart knowledge on morphology of immature stages of different groups of insects. CO 2: Train students in identification of common pest species during their immature stages.
<b>Advanced Insect Physiology (ENT 603)</b>	CO 1: Impart knowledge to the students on detailed physiology of various secretory and excretory systems. CO 2: Description of moulting process, chitin synthesis, CO 3: Description of physiology of digestion, transmission of nerve impulses. CO 4: Description of nutrition of insects, pheromones etc.



<b>Advanced Insect Ecology (ENT 604)</b>	CO 1: Impart advanced practical knowledge of causal factors governing the distribution and abundance of insects CO 2: Description of the evolution of ecological characteristics.
<b>Minors</b>	
	The student shall have the option to take two split minor subjects depending upon his / her research problem (minimum 8 credit hours) in the related subjects viz. Plant Pathology, Agronomy, Soil Science, Vegetable Science and Fruit Science in 500 series courses
<b>Ph.D. Entomology, 2<sup>nd</sup>Sem.</b>	
<b>Major</b>	
<b>Recent Trends in Biological Control (ENT 606)</b>	CO 1: Appraise the students with advanced techniques in handling of different bio-agents CO 2: Described modern methods of biological control CO 3: Scope of bio-agents in cropping system-based pest management in agro-ecosystems.
<b>Advanced Insecticide Toxicology (ENT 607)</b>	CO1: Acquaint the students with the latest advancements in the field of insecticide toxicology. CO2: Describe the biochemical and physiological target sites of insecticides CO 3: Explained the pesticide resistance mechanisms in insects.
<b>Advanced Insect Pest Management (ENT 612)</b>	CO 1: Acquaint the students with recent concepts of integrated pest management. CO 2: Surveillance and data base management. CO 3: Successful national and international case histories of integrated pest management CO 4: Role of non-conventional tools in pest management.
<b>Minor</b>	
	The student shall have the option to take two split minor subjects depending upon his/ her research problem (minimum 8 credit hours) in the related subjects viz. Plant Pathology, Agronomy, Soil Science, Vegetable Science and Fruit Science in 500 series courses
<b>Supporting course</b>	
	The student shall have the option to take minimum five credits in the supporting subject in 500 series courses. The supporting subject will not be related to the major subject. It could be any subject considered relevant for student's research work
<b>Ph.D. Entomology, 3<sup>rd</sup> Sem. onwards</b>	
<b>Doctoral Research (ENT 699)</b>	CO 1: Identification of important pest problem of essential food and forage crops. CO 2: Minimizing the impact of those pests as major research objective, with emphasis on taxonomy, molecular studies, integrated management, toxicology etc.

## Programme

### M.Sc. Ag. Genetics and Plant Breeding

<b>Programme Outcomes</b>	By the end of this course, students will be able to determine breeding methodology appropriate for plants with different mating systems, conduct basic statistical analyses related to plant breeding, to identify characteristics of self- and cross-pollinated plants, identify sources of genetic variation to conduct a breeding program, analyse journal articles related to cultivar development, conduct and analyse a selection experiment, communicate background information and original ideas related to breeding a specific crop.
<b>Programme specific outcomes</b>	Students will care the plants and make sure they stay healthy. They will also assist in genetic research of plant breeding collect specimens and samples and grow cultures of micro-organisms, prepare specimens for examination and perform experiments, write reports on results and findings, check the quality of plants, set up and maintain instruments and equipment, set up, operate and maintain laboratories for botanical breeding.
<b>M.Sc. Ag. Genetics and Plant Breeding Jobs</b>	After getting degree, students can make career or get job in agriculture ministries, research laboratories, agricultural scientist, ICAR, CSIR institute, DBT, DST, crop research directorates, educational institutes, plant breeding centers, genetic engineering, biotechnology companies, crop plantation facilities, firms, nurseries, agriculture departments etc.

#### Course outcomes (COs)

Course	Course outcomes (COs)
<b>M. Sc. Genetics and Plant Breeding (1<sup>st</sup> Sem.)</b>	
<b>Principles of Genetics (GP 501)</b>	<p>CO-1: A thorough understanding of the basic principles of DNA structure, replication, transcription and translation</p> <p>CO-2: An understanding of basic chromosome structure, and the significance of chromosomal change in evolution</p> <p>CO-3: Development of the ability to carry out genetic analyses on data sets comprised of codominant genetic markers such as allozymes, microsatellites and SNPs, in order to quantify variation, gene flow and evolutionary divergence</p> <p>CO-4: The ability to carry out complex genetic tests on genetic data for the purposes of diversity study</p> <p>CO-5: Apply the principles of inheritance to plant breeding</p>
<b>Principles of Cytogenetics (GP 502)</b>	<p>CO-1: Evolution of various chromosomal aberrations (structural and numerical), their applications in alien gene transfer and hybrid seed development.</p> <p>CO-2: Pollen culture in haploid development and development of diploid inbreds or hybrids or doubled isogenic lines from haploids that has got important applications in plant breeding.</p> <p>CO-3: With cytogenetic tools such as FISH and GISH (Genomic In Situ Hybridization) techniques, that rely on "painted chromosomes" approach, the behaviour of individual genomes, individual chromosomes, or chromosomal</p>

	<p>fragments in natural and artificial hybrids (particularly allopolyploids) can be analysed.</p> <p>CO-4: Another important application of plant cytogenetics is in validation of physical maps and guiding efficient choice of bacterial artificial chromosomes for sequencing of genomes using chromosome walking and chromosome jumping.</p>
<b>Principles of Plant Breeding (GP 503)</b>	<p>CO-1: Students will be well versed in practical emasculation and pollination methods of important crops.</p> <p>CO-2: To understand the various components to structure a plant breeding programme</p> <p>CO-3: Know the requirements in breeding for biotic and abiotic stress tolerant varieties.</p> <p>CO-4: Learn the impact of IPRs including PBR, PVP and PPVFRA</p> <p>CO-5: Students will acquire independent ability to carry out statistical analysis of data and Interpretation of results in breeding programs.</p>
<b>M. Sc. Genetics and Plant Breeding (2<sup>nd</sup> Sem.)</b>	
<b>Principles of Quantitative Genetics (GP 504)</b>	<p>CO-1: Analyse and evaluate literature involving quantitative genetic experiment</p> <p>CO-2: Design and analyse quantitative genetic experiments</p> <p>CO-3: Statistically analyse the phenotypic data of plant traits collected taking into account G X E interaction.</p> <p>CO-4: Manage breeding populations to maximize progress from selection for accomplishment of breeding objectives</p>
<b>Cell Biology and Molecular genetics (GP 508)</b>	<p>CO-1: Understand and apply the principles and techniques of Molecular biology.</p> <p>CO-2: Comprehensive understanding on Nucleic acids that provides insight into cellular and molecular mechanisms.</p> <p>CO-3: The knowledge on DNA control mechanism in terms of replication and recombination to design and execute gene manipulation research underlying social and environmental ventures.</p> <p>CO-4: The ability to synthesize, evaluate and understand molecular marker-based data.</p>
<b>M. Sc. Genetics and Plant Breeding (3<sup>rd</sup> Sem.)</b>	
<b>Biotechnology for Crop improvement (GP 509)</b>	<p>CO-1: Ability to apply the concepts and principles of plant tissue culture techniques on research problems pertinent to crop improvement</p> <p>CO-2: Dissemination of skills on usage of the acquired knowledge on practical biotechnology tools to augment need based research.</p> <p>CO-3: Technical knowhow and exhibition of contemporary knowledge in Biotechnology for economic utilization.</p> <p>CO-4: Compile and interpret results applying tools of biotechnology research.</p> <p>CO-5: Applying learned process to undertake sustainable exploitation of plant and microbial resources in an environmentally-sensitive manner.</p>
<b>Heterosis Breeding</b>	CO-1: Learn about mechanisms of heterosis.

<b>(GP 507)</b>	CO-2: understand Divergence and Genetic Distance analyses. CO-3: Development of inbreeds and parental lines CO-4: learn about hybrid seed production.
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**Programme outcomes Programme specific outcomes and course outcomes**

**M.Sc. Ag. Horticulture (Floriculture and Landscape Architecture)**

<b>M.Sc. Ag. Horticulture (Floriculture and Landscape Architecture)</b>	
<b>Programme Outcomes</b>	<ol style="list-style-type: none"><li>1. After doing post- graduation in M.Sc. Ag. Horticulture (Floriculture and Landscape Architecture) the student become eligible to be appropriate for employment offered by bank, finance sectors, insecticide and pesticide companies, fertilizers companies, sales and marketing.</li><li>2. The Nationalized Banks, Reserve Bank, State Bank NABARD etc. put forward an opportunity for post-graduates in Agriculture and Horticulture as Agriculture Officers, Agriculture Assistant Officers, Probationary Officers, Field Officers and Rural Development Officers.</li><li>3. Different agricultural universities also employ horticultural post- graduates for different posts from the concerned field of their specialization as JRF, (Junior Research Fellowship), SRF ( Senior Research Fellowship) TA ( Technical Assistant) and Lab Assistant.</li><li>4. Indian Council of Agricultural Research and Department of Science and Technology (DST) also engage students in various posts according to their requirement.</li><li>5. National Horticulture Board also engage students in various posts according to their requirement.</li><li>6. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.</li></ol>
<b>Programme Specific outcomes</b>	<ol style="list-style-type: none"><li>1. Students having a combined knowledge of Floriculture and Landscape Architecture with entrepreneurial skill permit them to get administrative or marketing position with organizations involved in the marketing of flowers and cut flowers, they also get recruited in the companies as horticulturist, gardeners, supervisors, farm managers, handling large scale production of certain varieties of fruits in various private seed companies.</li><li>2. Many fertilizers and pesticide companies engage students in their firms where they work as managers.</li></ol>

	<ol style="list-style-type: none"> <li>3. At the International level, different agencies appoint horticultural consultants.</li> <li>4. Individuals who have completed the post-graduate degree in Horticulture ( Fruit Science) can work as farm or estate managers, supervisors, technical assistant and project coordinators.</li> <li>5. After gaining experience, they will get positions of specialists for handling of fruit plantation, nursery and other orchard management project.</li> <li>6. After gaining experience, they will increase farmers' income through adopting hi-tech horticulture.</li> </ol>
<b>Course Outcomes</b>	<b>Outcomes</b>
<b>Breeding of Flower Crops and Ornamental Plants (FLA 501)</b>	CO 1: The students will be well- versed with different methods adopted for improvement of flower crops and ornmental plants, as well as the latest technology engaged in crop improvement for the benefit of humanity.
<b>Production Technology of Cut Flowers (FLA 502)</b>	<p>CO 1: The students will know about the package and practices of production technology of cut flower along with the knowledge of diseases, pests and physiological disorders, mineral deficiency problems, maturity indices for harvesting the crops and economics of the cut flowers.</p> <p>CO 2: Development innovative agro- techniques to enhance the production and productivity of cut flowers.</p> <p>CO 3: After gaining experience, they will increase farmers' income through adopting hi-tech horticulture.</p>
<b>Production Technology of Loose Flowers (FLA 503)</b>	<p>CO 1: To make them aware about impart knowlge about the importance and management of loose flowers.</p> <p>CO 2: The students will be acquainted understanding the scope of loose flowers trade, significance in the domestic market and export.</p> <p>CO 3: To make them aware knowlge about the water, nutrient management, weed management, pinching, disbudding , special horticultural practices and production for special occasions through physiological interventations.</p>
<b>Landscaping and Ornamental Gardening (FLA 504)</b>	<p>CO 1: To make them aware knowlge about the familiarization with principles and practices of landscapeing and ornamental gardening.</p> <p>CO 2 : This course will provide knowledge about landscape desings &amp; styles of garden, formal, informal and free style gardens.</p> <p>CO 3 : To make them aware about garden plant components arboretum, shrubbery, fernery, palmatum and production technology for selected ornamental plants.</p>



<p align="center"><b>Protected Floriculture ( FLA 505)</b></p>	<p>CO 1: This course will provide knowledge about the protected floriculture, types structure – greenhouse, polyhouse and shade house economics of flowers crops for protected cultivation.</p> <p>CO 2: To make them aware about interculture operation for environmental control, management and manipulation of temperatue, ligh, humidity, air and CO<sub>2</sub> heating and cooling system in the naturally ventilated greenhouses.</p> <p>CO 3 : The students will know about containers, substrates soil decontamination, layout of dripand fertigation system.</p>
<p align="center"><b>Value Addition in Flowers ( FLA 506)</b></p>	<p>CO 1: This course will provide knowledge about the prospects of value addition, National and global scenario, production and export, womens empowerment through value added products making and supply chain management.</p> <p>CO 2: To make them aware about the prolong the post harvest storage life of horticultural commodities and increase income through value addition of the products and to reduce post harvest losse.</p>
<p align="center"><b>Turfing and Turf Management (FLA 507)</b></p>	<p>CO 1: Students will learn about the principles and management of turfing.</p> <p>CO 2: To make them aware about preparatory operations, growing media used for turf grasses, turf established method.</p>
<p align="center"><b>Job Prospects</b></p>	<p>On completion of degree there is an opportunity for post graduates in Floriculture and Landscape Architecture as Agriculture Officers, Agriculture Assistant Officers, Probationary Officers, Field Officers and Rural Development Officers.</p> <p>Students also recruited as JRF, (Junior Research Fellowship), SRF ( Senior Research Fellowship) TA ( Technical Assistant), Lab Assistant etc. bank, finance sectors, insecticide and pesticide companies, fertilizers companies, sales and marketing.</p>
<p align="center"><b>Research</b></p>	<ol style="list-style-type: none"> <li>1. M.Sc. Floriculture and Landscape Architecture student can pursure higher education Ph. D.</li> <li>2. Students after completion of degree could be engaged in developing new and improved types of fruits.</li> <li>3. Students could get in touch with the horticultural scientists who also devote considered time improve the aesthetics of ornamental and the quality of products.</li> </ol>

**Programme outcomes Programme specific outcomes and course outcomes**

**M.Sc. Ag. Horticulture (Fruit Science)**

<b>M.Sc. Ag. Horticulture (Fruit Science) 1<sup>st</sup> semester</b>	
<b>Courses</b>	<b>Outcomes</b>
<b>Programme Outcome</b>	<ol style="list-style-type: none"><li>1. After doing post- graduation in M.Sc. Ag. Horticulture (Fruit Science) the student become eligible to be appropriate for employment offered by bank, finance sectors, insecticide and pesticide companies, fertilizers companies, sales and marketing.</li><li>2. The Nationalized Banks, Reserve Bank, State Bank NABARD etc. put forward an opportunity for post-graduates in Agriculture and Horticulture as Agriculture Officers, Agriculture Assistant Officers, Probationary Officers, Field Officers and Rural Development Officers.</li><li>3. Different agricultural universities also employ horticultural post- graduates for different posts from the concerned field of their specialization as JRF, (Junior Research Fellowship), SRF ( Senior Research Fellowship) TA ( Technical Assistant) and Lab Assistant.</li><li>4. Indian Council of Agricultural Research and Department of Science and Technology (DST) also engage students in various posts according to their requirement.</li><li>5. National Horticulture Board also engage students in various posts according to their requirement.</li><li>6. Create job opportunities for the unemployed youths through teaching, research, training, extension etc., especially for the development of socially and economically depressed segment of society.</li></ol>
<b>Programme Specific outcomes</b>	<ol style="list-style-type: none"><li>1. Students having a combined knowledge of Fruit Science with entrepreneurial skill permit them to get administrative or marketing position with organizations involved in the processing and marketing of fruits, they also get recruited in the companies as horticulturist, gardeners, supervisors, farm managers, handling large scale production of certain varieties of fruits in various private seed companies.</li><li>2. Many fertilizers and pesticide companies engage students in their firms where they work as managers.</li></ol>

	<ol style="list-style-type: none"> <li>3. At the International level, different agencies appoint horticultural consultants.</li> <li>4. Individuals who have completed the post-graduate degree in Horticulture ( Fruit Science) can work as farm or estate managers, supervisors, technical assistant and project coordinators.</li> <li>5. After gaining experience, they will get positions of specialists for handling of fruit plantation, nursery and other orchard management project.</li> <li>6. After gaining experience, they will increase farmers' income through adopting hi-tech horticulture.</li> </ol>
<b>Tropical and Dryland Fruit Production (FSC 501)</b>	<p>CO 1: After completion of the degree programme, the students will be able to transfer knowledge of horticulture in the field of agriculture research especially in horticulture including fruits plants and their management.</p> <p>CO 2: The students will be acquainted with the production technology of tropical and dryland fruit production.</p> <p>CO 3: To make them aware of the interculture operation of fruit crops and also to study the economics these tropical and dryland fruit crops along with the knowledge of diseases, pests and physiological disorders, mineral deficiency problems maturity indices for harvesting the crops and economics of the tropical and dryland fruit crops.</p>
<b>Subtropical and Temperate Fruit Production (FSC 502)</b>	<p>CO 1: The students will know about the package and practices of subtropical and temperate fruit crops along with the knowledge of diseases, pests and physiological disorders, mineral deficiency problems maturity indices for harvesting the crops and economics of the subtropical and temperate fruit crops</p> <p>CO 2: Development innovative agro- techniques to enhance the production and productivity of subtropical and temperate fruit crops.</p> <p>CO 3: After gaining experience, they will increase farmers' income through adopting hi-tech horticulture</p>
<b>Biodiversity and Conservation Of Fruit Crops (FSC 503)</b>	<p>CO 1: The students will know about biodiversity, conservation issues and exploitation of biological diversity through crop management.</p> <p>CO:2 . The students will be acquainted understanding the biodiversity, centers of origin of cultivated fruit crops.</p> <p>CO 3: The students will be acquainted with the quantify economic importance of plants in managed ecosystems and the impact of horticultural crops in food systems.</p>
<b>Canopy Management in Fruit Crops (FSC 504)</b>	<p>CO 1: To make them aware about impart knowlge about the principles and prtices in canopy management in fruit crops.</p>

	<p>CO 2: This course will provide knowledge about basic various equipment &amp; tools used in canopy management of fruit crops.</p> <p>CO3 : To make them aware about canopy development and management in relation to growth , flowering, fruiting and fruit quality in temperate fruit and tropical or subtropical fruit crops.</p>
<b>Propagation and Nursery Management for Fruit Crops (FSC 505)</b>	<p>CO 1: This course will provide knowledge about basic familiarization with principles and practices of propagation and nursery management for fruit crops.</p> <p>CO 2: To make them aware about interculture operation for setting up of model nurseries in rural areas for availability of quality planting material.</p> <p>CO 3 : The students will know about life cycles in plants, cellular basis for propagation, sexual propagation, apomixis, polyembryony and chimeras.</p>
<b>Breeding of Fruit Crops (FSC 506)</b>	<p>CO 1: The students will be well- versed with different methods adopted for improvement of fruit crops, as well as the latest technology engaged in crop improvement for the benefit of humanity.</p>
<b>Biotechnology of Horticultural Crops (FSC 509)</b>	<p>CO 1: The students will know about the principles, theoretical aspects and developing skills in biotechnology of horticultural crops.</p> <p>CO 2: To make them aware about callus culture, cell division, differentiation, morphogenesis, organogenesis, embryogenesis and physiology of hardening</p>
<b>Job Prospects</b>	<p>On completion of degree there is an opportunity for post graduates in Fruit Science as Agriculture Officers, Agriculture Assistant Officers, Probationary Officers, Field Officers and Rural Development Officers.</p> <p>Students also recruited as JRF, (Junior Research Fellowship), SRF ( Senior Research Fellowship) TA ( Technical Assistant), Lab Assistant etc. bank, finance sectors, insecticide and pesticide companies, fertilizers companies, sales and marketing.</p>
<b>Research</b>	<ol style="list-style-type: none"> <li>1. M.Sc. Fruit Science student can pursue higher education Ph. D.</li> <li>2. Students after completion of degree could be engaged in developing new and improved types of fruits.</li> <li>3. Students could get in touch with the horticultural scientists who also devote considered time improve the aesthetics of ornamental and the quality of products.</li> </ol>

**PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES****M.Sc. Ag. Plant Pathology**

<b>Program outcome</b>	Plant Pathologist commonly work with plant breeders, farmers, entomologists, and botanists in the farms and gardens where plants grow. Additionally, plant pathologists engage with biological scientists and engineers to create safer living arrangements to allow plants to reach their maximum growth, yield and having potential to boost the Indian agriculture economy.
<b>Program specific outcomes</b>	Students of Plant Pathology comprises with the basic knowledge and technologies of Botany, Plant Anatomy, Plant Physiology, Mycology, Bacteriology, Virology, Nematology, Genetics, Molecular Biology, Genetic Engineering, Biochemistry, Horticulture, Tissue Culture, Soil Science, Forestry, Physics, Chemistry, Meteorology, Statistics and many other branches of applied science.
<b>COURSE OUTCOMES</b>	<b>M.SC. (PLANT PATHOLOGY) PROGRAM</b>
<b>COURSE: MYCOLOGY (PL PATH-501)</b>	
<b>CO1.</b>	Describe the introduction, definition of different terms and basic concepts of mycology
<b>CO2.</b>	Elaborate the importance of mycology in agriculture, relation of fungi to human affairs and historical landmarks of mycology.
<b>CO3.</b>	Elaborate the concepts of nomenclature and classification, fungal biodiversity, reproduction in fungi.
<b>CO4.</b>	Explain the comparative morphology, ultrastructure, characters of different groups of fungi up to generic level: (a) Myxomycota and (b) Eumycota- i) Mastigomycotina ii) Zygomycotina, iii) Ascomycotina, iv) Basidiomycotina, v) Deuteromycotina.
<b>CO5.</b>	Define the Lichens, its types and importance, fungal genetics and variability in fungi.
<b>COURSE: PLANT VIROLOGY (PL PATH-502)</b>	
<b>CO1.</b>	Scientific knowledge: Apply the knowledge of plant viruses in terms of composition, structure and nature of plant viruses
<b>CO2.</b>	To study physical and chemical properties, symptomatology, transmission nature, how plant viruses spread from place to another places
<b>CO3.</b>	Detail classification, nomenclature, replication of plant viruses in plant system
<b>CO4.</b>	Understand the basic concept of isolation and purification of plant viruses with help of SEM and TEM microscope
<b>CO5.</b>	Perform procedures and working of electron microscope and ultra-microtome and understand the basic concept of different organisms

	related to viruses such as baculoviruses, RNA phages, Satellite viruses, prions etc.
<b>CO6.</b>	To understand the basic concept of genetic engineering, mechanism of resistance and management of plant viruses
<b>COURSE: PLANT BACTERIOLOGY (PL PATH-503)</b>	
<b>CO1.</b>	Develop a understanding of importance of phytopathogenic bacteria and to study in detail about different phytopathogenic bacteria such as MLOs, spiroplasmas, fastidious bacteria
<b>CO2.</b>	Develop an procedure for understanding of evolution, classification and nomenclature of plantpathogenic bacteria
<b>CO3.</b>	Describe a procedure for understanding of growth nutrients, reproduction and preservation of bacterial cultures
<b>CO4.</b>	Understand the general biology of bacteriophages, L form bacteria and plasmids
<b>CO5.</b>	Describe mode of action of prokaryotic inhibitors
<b>CO6.</b>	Develop an understanding of survival and dissemination of plant pathogenic bacteria
<b>COURSE: PRINCIPLES OF PLANT PATHOLOGY (PL PATH-504)</b>	
<b>CO1.</b>	Describe in detail definations, concept, history of plant disease. Provide basic understanding about biotic and abiotic factors and causes of plant disease
<b>CO2.</b>	Develop an understanding about growth, reproduction and role of environment in plant diseases
<b>CO3.</b>	Enumerate and explain recognition concept and infection, symptomatology, disease development- role of enzymes, toxins, growth regulators; defense strategies- oxidative burst; Phenolics, Phytoalexins, PR proteins, Elicitors. Altered plant metabolism as affected by plant pathogens
<b>CO4.</b>	Develop an understanding about genetics of resistance; 'R' genes; mechanism of genetic variation in pathogens; molecular basis for resistance; marker-assisted selection; genetic engineering for disease resistance.
<b>CO5.</b>	Explain in detail different plant management strategies
<b>COURSE: DETECTION AND DIAGNOSIS OF PLANT DISEASES (PL PATH 505)</b>	
<b>CO1.</b>	Describe the methods to prove Koch's postulates with biotroph and necrotroph pathogens, pure culture techniques, use of selective media to isolate pathogens.
<b>CO2.</b>	Explain the preservation of plant pathogens and disease specimens, use of haemocytometer, micrometer, centrifuge, pH meter, cameralucida.



<b>CO3.</b>	Describe the microscopic techniques and staining methods, phase contrast system, chromatography, use of electron microscope, spectrophotometer, ultracentrifuge and electrophoretic apparatus, disease diagnostics, serological and molecular techniques for detection of plant pathogens.
<b>CO4.</b>	Understanding of evaluation of fungicides, bactericides etc.; field experiments, data collection and preparation of references.
<b>COURSE: PRINCIPLES OF PLANT DISEASE MANAGEMENT (PL PATH 506)</b>	
<b>CO1.</b>	Explain the principles of plant disease management by cultural, physical, biological, chemical, organic amendments and botanicals methods of plant disease control, integrated control measures of plant diseases.
<b>CO2.</b>	Describe the disease resistance and molecular approach for disease management.
<b>CO3.</b>	Describe the foliage, seed and soil application of chemicals, role of stickers, spreaders and other adjuvants, health vis-a-vis environmental hazards, residual effects and safety measures
<b>CO4.</b>	Understanding of history of fungicides, bactericides, antibiotics, concepts of pathogen, immobilization, chemical protection and chemotherapy, nature, properties and mode of action of antifungal, antibacterial and antiviral chemicals
<b>COURSE: INTEGRATED DISEASE MANAGEMENT (PL PATH 516)</b>	
<b>CO1.</b>	Describe the introduction, definition, concept and tools of disease management, components of integrated disease management- their limitations and implications.
<b>CO2.</b>	Understanding the development of IDM- basic principles, biological, chemical and cultural disease management.
<b>CO3.</b>	Understanding the IDM in important crops- rice, wheat, cotton, sugarcane, chickpea, rapeseed- mustard, pearl millet, <i>kharif</i> pulses, vegetable crops and fruit crops.
<b>COURSE: LIBRARY AND INFORMATION SERVICES (PGS-501)</b>	

<b>CO 1.</b>	To understand Introduction to library and its services; Role of libraries in education, research and technology transfer; Classification systems and organization of library; Sources of information- Primary Sources, Secondary Sources and Tertiary Sources; Intricacies of abstracting and indexing services (Science Citation Index, Biological Abstracts, Chemical Abstracts, CABI Abstracts, etc.); Tracing information from reference sources; Literature survey; Citation techniques/Preparation of bibliography; Use of CD-ROM Databases, Online Public Access Catalogue and other computerized library services; Use of Internet including search engines and its resources; eresources access methods.
<b>COURSE: TECHNICAL WRITING AND COMMUNICATIONS SKILLS (PGS-502)</b>	
<b>CO1.</b>	Various forms of scientific writings- theses, technical papers, reviews, manuals, etc; Various parts of thesis and research communications (title page, authorship contents page, preface, introduction, review of literature, material and methods, experimental results and discussion). Grammar (Tenses, parts of speech, clauses, punctuation marks); Error analysis (Common errors); Concord; Collocation; Phonetic symbols and transcription; Accentual pattern: Weak forms in connected speech: Participation in group discussion: Facing an interview; presentation of scientific papers.
<b>COURSE: EXPERIMENTAL DESIGNS (SPG-502)</b>	
<b>CO1.</b>	To understand various uniformity trials, size and shape of plots and blocks; Analysis of variance; Completely randomized design, randomized block design and Latin square design. Split plot and strip plot designs; Analysis of covariance and missing plot techniques in randomized block and Latin square designs; Transformations, crossover designs, balanced incomplete block design, resolvable designs and their applications ~ Lattice design, alpha design - concepts, randomisation procedure, analysis and interpretation of results. Response surfaces. Experiments with mixtures.
<b>COURSE: INTELLECTUAL PROPERTY AND ITS MANAGEMENT IN AGRICULTURE (PGS-503)</b>	
<b>CO1.</b>	To understand historical perspectives and need for the introduction of Intellectual Property Right regime; TRIPs and various provisions in TRIPs Agreement; Intellectual Property and Intellectual Property Rights (IPR), benefits of securing IPRs; Indian Legislations for the protection of various types of Intellectual Properties; Treaty on Plant Genetic Resources for Food and Agriculture; Licensing of technologies, Material transfer agreements, Research collaboration Agreement, License Agreement.
<b>COURSE: BASIC CONCEPTS IN LABORATORY TECHNIQUES (PGS-504)</b>	
<b>CO1.</b>	Safety measures while in Lab; Handling of chemical substances; Use of burettes, pipettes, measuring cylinders, flasks, separatory funnel, condensers, micropipettes and vaccumets; washing, drying and sterilization of glassware; Drying of solvents/chemicals. Weighing and

	preparation of solutions of different strengths and their dilution; Handling techniques of solutions; Preparation of different agrochemical doses in field and pot applications; Preparation of solutions of acids; Neutralisation of acid and bases; Preparation of buffers of different strengths and pH values. Use and handling of microscope, laminar flow, vacuum pumps, viscometer.
<b>COURSE: REMOTE SENSING &amp; GEOGRAPHIC INFORMATION SYSTEM (SPG 503)</b>	
<b>CO1.</b>	The use of arial photography, satellite imagery and geographic information syatem for the collection, storrage and spatial analysis for geo-reference.Future prospects of remote sensing in India, software used in remote sensing, GIS versus remote sensing, Introduction to GIS software.
<b>COURSE: AGRICULTURAL DEVELOPMENT PROGRAMMES (PGS-505)</b>	
<b>CO1.</b>	To understand history of agriculture in brief; Global agricultural research system: need, scope, opportunities; Role in promoting food security, reducing poverty and protecting the environment; National Agricultural Research Systems (NARS) and Regional Agricultural Research Institutions; Consultative Group on International Agricultural Research (CGIAR): International Agricultural Research Centres (IARC), partnership with NARS, role as a partner in the global agricultural research system, strengthening capacities at national and regional levels; International fellowships for scientific mobility
<b>COURSE: DISASTER MANAGEMENT (PGS-506)</b>	
<b>CO1.</b>	Disaster Management- Efforts to mitigate natural disasters at national and global levels. International Strategy for Disaster reduction. Concept of disaster management, national disaster management framework; financial arrangements; role of NGOs, Community-based organizations, and media. Central, State, District and local Administration; Armed forces in Disaster response; Disaster response: Police and other organizations.
<b>COURSE: CASSIFICATION OF INSECTS (ENT-504)</b>	
<b>CO1.</b>	Brief evolutionary history of Insects- introduction to phylogeny of insects and Major Classification of Superclass Hexapoda–Classes – Ellipura (Collembola, Protura), Diplura and Insecta- Orders contained.Distinguishing characters, general biology, habits and habitats of Insect orders and economically important families contained in them (Continued). Subclass: Pterygota, Division: Neoptera: Subdivision: Orthopteroid and Blattoid Orders (=Oligoneoptera: Plecoptera, Blattodea, Isoptera, Mantodea, Grylloblattodea, Dermaptera, Orthoptera, Phasmatodea, Mantophasmatodea, Embioptera, Zoraptera), Subdivision: Hemipteroid Orders (=Paraneoptera): Psocoptera, Phthiraptera, Thysanoptera and Hemiptera.Distinguishing characters, general biology, habits and habitats of Insect orders and economically

	important families contained in them (Continued). Division Neoptera – Subdivision Endopterygota, Section Neuropteroid- Coleopteroid Orders: Strepsiptera, Megaloptera, Raphidioptera, Neuroptera and Coleoptera, Section Panorpid Orders Mecoptera, Siphonaptera, Diptera, Trichoptera, Lepidoptera, and Section Hymenopteroid Orders: Hymenoptera.
<b>COURSE: PRINCIPLES OF INTEGRATED PEST MANAGEMENT (ENT-510)</b>	
<b>CO1.</b>	Concept and philosophy, ecological principles, economic threshold concept, and economic consideration. Political, social and legal implications of IPM; pest risk analysis; pesticide risk analysis; cost-benefit ratios and partial budgeting; case studies of successful IPM programmes. Tools of pest management and their integration- legislative, cultural, physical and mechanical methods; pest survey and surveillance, forecasting, types of surveys including remote sensing methods, factors affecting surveys.
<b>COURSE: TECHNIQUES IN PLANT PROTECTION (ENT-518)</b>	
<b>CO1.</b>	Pest control equipments, principles, operation, maintenance, selection, application of pesticides and biocontrol agents, seed dressing, soaking, root-dip treatment, dusting, spraying, application through irrigation water. Protein isolation from the pest and host plant and its quantification using spectrophotometer and molecular weight determination using SDS/PAGE. Computer application for predicting/forecasting pest attack and identification.

<b>M. Sc. Food Science and Technology</b>	
Programme outcomes	The students get a systematic or coherent understanding of the fundamental concepts, principles, and processes underlying the academic field of food science and technology, its different subfields (food chemistry, nutrition, processing, engineering, etc.), and its linkages with related disciplinary areas/subjects; procedural knowledge that creates different types of professionals in the field of food science and technology and related fields such as food industry, teaching, research, product quality, consumer goods industry, food products, etc.; skills related to specialization areas within food science and technology, and other related fields of study, including broader interdisciplinary subfields(biotechnology, nanotechnology, etc.). Students will get the ability to recognize and appreciate the importance of the food sciences and their application in academic, industrial, economic, environmental, and social contexts.
Programme specific outcomes	The students acquire technical knowledge in post-harvest handling of food for its processing and storage. They will develop an ability to develop food products as well as their analysis in the contest to quality and its safety. The students develop sufficient technical knowledge to start up a food business.

### **Course Outcomes**

<b>M. Sc. 1<sup>st</sup> semester</b>	
<b>Courses</b>	<b>Outcomes</b>
Food Chemistry & Nutrition (FST 501)	CO 1: To acquaint with properties and role of various constituents in foods, interaction and changes during processing. CO 2: Importance of various foods and nutrients in human nutrition.
Food Microbiology (FST 502)	CO 1: To acquaint with different groups of micro-organisms associated with food, their activities,destruction and detection in food. CO 2: Description of food hygiene and sanitation, food fermentations.
Principles of Food Processing (FST 504)	CO 1: To acquaint with Scope of food processing; historical developments and principles of food processing and preservation. CO 2: Description of processing and preservation by non-thermal methods. CO 3: Use and application of enzymes and microorganisms in processing and preservation of foods.
Technology of Fruits and Vegetable Processing (FST 512)	CO 1: To acquaint with principles and methods of preservation of fruits and vegetables into variousproducts

	CO 2: Description of technology for processed products, dehydration of fruits and vegetables using various drying technologies.
Mathematics (FST 451)	CO 1: To provide basic knowledge and fundamentals of mathematics to provide a sound foundation for engineering-related subjects. CO 2: Differential calculus, integral calculus, trigonometry, and two-dimensional geometry.
General Microbiology (FST 452)	CO 1: To provide basic knowledge about growth, reproduction, requirements of different groups of micro-organisms. CO 2: Learning of techniques of isolation, identification, and enumeration of microorganisms.
<b>M. Sc. 2<sup>nd</sup> semester</b>	
Food Packaging Technology (FST 505)	CO 1: To acquaint the students with packaging methods, packaging materials, packaging machinery, modern packaging techniques, etc. CO 2: Description of properties of materials, Packaging equipment, and machinery.
Food Quality Systems & Management (FST 506)	CO 1: To acquaint with food quality parameters and control systems, food standards, regulations, specifications. CO 2: Description of Indian & International quality systems and standards like ISO and Food Codex.
Techniques in Food Analysis (FST 507)	CO 1: To acquaint with food quality parameters and control systems, food standards, regulations, specifications. CO 2: Sampling techniques, Chromatographic techniques, and Separation techniques.
Technology of Milk and Milk Products (FST 516)	CO 1: To acquaint with techniques and technologies of testing and processing of milk into various products and by-products. CO 2: Technology of condensed milk, cream, ice cream, cheese, and Indigenous milk products.
Statistical Methods for Food Science (FST 531)	CO 1: Exposure of students to various statistical tools required to analyze the experimental data in food research and industry. CO 2: Descriptive statistics, estimation, and confidence intervals hypothesis testing.
<b>M. Sc. 3<sup>rd</sup> semester</b>	
Food Engineering (FST 503)	CO 1: To acquaint with the basic principle of food engineering and its processes, with the importance of various food processes and their evaluation. CO 2: Description of a method for thermal process evaluation, food chilling and freezing, and process heat transfer.



Technology of Cereals, Pulses, and Oilseeds (FST 513)	CO 1: To acquaint with production and consumption trends, structure, composition, quality evaluation, and processing technologies for product development. CO 2: Description of the value addition of various cereals, pulses, and oilseeds.
Applied Nutrition (FST 534)	CO 1: To acquaint the students with the importance of nutrition, balanced diets, therapeutic diets for health. CO 2: Description of the role of food and nutraceuticals in health.
Master's seminar (FST 591)	CO 1: To develop presentation skills among students. CO 2: Presentation and discussion by each student on current topics/interests in Food Processing Technology.
Crop Production: Concepts and Practices (FST 553)	CO 1: To impart theoretical and practical knowledge about crop production under different agro-ecological conditions. CO 1: Quality of good seed, crop rotations, rain-fed agriculture, and dry farming.
<b>M. Sc. 4<sup>th</sup> semester</b>	
Industrial Training (FST 590)	CO 1: In-plant training is intended to expose the students to an environment in which they are expected to be associated in their future careers. CO 2: The students will gain hands-on experience in one or more commercial establishments.
Master Research (FST 599)	CO 1: To investigate selected problems of special interests in Food Technology by individual students. CO 2: The work includes library work, field or laboratory research, recording data, analyzing data, and writing a dissertation.

**Programme outcomes, Programme specific outcomes and course outcomes**  
**M.Sc. Ag. Horticulture (Vegetable Science)**

<b>Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. After doing post-graduation in M.Sc. Ag. Horticulture (Vegetable Science) the student becomes eligible to be appropriate for employment offered by banks, finance sectors, seed companies, insecticide and pesticide companies, sales and marketing etc.</li> <li>2. The nationalized banks, Reserve Bank, State Bank, NABARD etc. put forward an opportunity for post graduates in agriculture and horticulture as Agricultural Officers, Probationary Officers, Field Officers and Rural Development Officers.</li> <li>3. Different agricultural universities also employ horticultural postgraduates for distinct posts from the concerned field of their specialization as SRF's (Senior Research Fellow), TA (Technical Assistant) etc.</li> <li>4. Indian Council of Agricultural Research and Department of Science and Technology (DST) also engage students in different posts according to their requirement.</li> </ol>
<b>Programme specific outcomes</b>	<ol style="list-style-type: none"> <li>1. Students having a combined knowledge of Vegetable Science with entrepreneurial skills enable them to get administrative or marketing positions with organizations involved in the processing and marketing of vegetables, they also get recruited in the companies as horticulturists, gardeners, supervisors, farm or estate managers, handling large scale production of certain varieties of vegetables in various private seed companies etc.</li> <li>2. Many fertilizer and pesticide companies engage students in their firms where they work as managers.</li> <li>3. At the International level, different agencies appoint horticultural consultants.</li> <li>4. And other different positions as per their requirement.</li> </ol>
<b>Course M.Sc. Ag. Horticulture (Vegetable Science) Outcomes</b>	
<b>VSC-501 (Production Technology of Cool Season Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will be acquainted with the production technology of important cool season vegetable crops.</li> <li>❖ To make them aware of the intercultural operations of winter vegetables and also to study the economics of these cool season vegetable crops.</li> </ul>
<b>VSC-502 (Production Technology of Warm Season Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will know about the package of practices of the warm season vegetables along with the knowledge of physiological disorder, mineral deficiency problems, maturity standards for harvesting the crops and economics of these warm season vegetable crops.</li> </ul>
<b>VSC-503 (Breeding of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will be well-versed with various methods adopted for improvement of vegetable crops, as well as the latest technology engaged in crop improvement for the benefit of humanity.</li> </ul>
<b>VSC-504 (Growth and Development of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ This course will provide knowledge about basic cell functions, growth and development stages, roles and applications of plant growth regulators. It will also acquaint the students with basic physiological processes involved in flowering, fruit set and environmental factors associated.</li> </ul>
<b>VSC-505 (Seed Production Technology of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will be acquainted with importance of quality seed production, various methods of seed production in self and open pollinated vegetable crops.</li> </ul>
<b>VSC-507 (Production Technology of Underexploited Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will be well versed with nutritional importance and package of practices of underexploited vegetables so as to enhance their production.</li> </ul>

<b>VSC-508 (Organic Vegetable Production Technology)</b>	❖ Student will understand the concepts of organic farming. Use of various organic inputs for vegetable production, use of non-synthetic agents for crop production, will get some idea about organic certification.
<b>VSC-509 (Fundamentals of Processing of Vegetables)</b>	❖ The students will know the various ways for value addition in vegetable crops
<b>Job Prospects</b>	On completion of degree there is an opportunity for post graduates in Vegetable Science as Agricultural Officers, Probationary Officers, Field Officers and Rural Development Officers. Students are also recruited as SRF's (Senior Research Fellow), TA (Technical Assistant) etc. Banks, finance sectors, seed companies, insecticide and pesticide companies, sales and marketing etc.
<b>Research</b>	<ol style="list-style-type: none"> <li>1. M.Sc. Vegetable student can pursue higher education Ph.D.</li> <li>2. Student after completion of degree could be engaged in developing new and improved types of vegetables.</li> <li>3. Students could get in touch with the horticultural scientists who also devote considerable time to improve the aesthetics of ornamentals and the quality of products.</li> </ol>

<b>M. Tech. Food Technology</b>	
<b>M. Tech. Food Technology</b>	
Programme outcomes	Students will get the ability to apply principles of food engineering in industry, understand, identify and analyze the problem related to the food industry and ability to find an appropriate solution for the same. They will be able to design, implement and evaluate a research-based project to meet demands of the society. Students will get the ability to use appropriate techniques, skills, and modern tools in the food industry and the academic profession. They will get the proper understanding of professional, ethical, legal, security, and social issues and responsibilities for entrepreneurship skills.
Programme specific outcomes	Students acquire in-depth theoretical and practical knowledge of mathematics, food science, and engineering. They will get proficiency in solving engineering problems related to the food industry and focus on the importance of safe processed nutritious food. They will develop an ability to work in Food industries, research organizations and academia as well as to design or process food products as per the needs and specifications.

### Course Outcomes

<b>M. Tech. 1<sup>st</sup> semester</b>	
<b>Courses</b>	<b>Outcomes</b>
Advances in Food Chemistry & Nutrition (FST 601)	CO 1: Interactions among food components and water relationships in foods. CO 2: Description of fragrance and flavouring compounds. CO 3: Description of therapeutic, parenteral and geriatric nutrition and relevant food formulations and chemistry of alkaloids, flavonoids and other phenolics.
Modern Food Microbiology (FST 602)	CO 1: Factors influencing the development of microbes in food. CO 2: Microbial behavior against the newer methods of food processing. CO 3: Modern methods of cell culture, cell immobilization, and applications.
Food Processing (FST 604)	CO 1: To develop an insight among the students about the existing modern techniques and their applications in food processing. CO 2: Description of membrane technology, microwave and radio frequency processing and high-pressure processing. CO 3: Application of newer techniques in food processing.

Juice Processing Technology (FST 623)	CO 1: To understand the fundamentals of juice processing technology CO 2: To acquaint with various equipment & tools for juice extraction
Library and Information Services (PGS-501)	CO 1: Introduction to library and its services and role of libraries in education, research, and technology transfer CO 1: Use of CD-ROM Databases, Online Public Access Catalogue, and other computerized library services
Technical Writing and Communications Skills (PGS-502)	CO 2: To equip the students/scholars with skills to write dissertations, research papers, etc. CO 3: To equip the students/scholars with skills to communicate and articulate in English (verbal as well as writing).
<b>M. Tech. 2<sup>nd</sup> semester</b>	
Food Packaging (FST 605)	CO 1: Learning of active and intelligent packaging. CO 2: Description of non-migratory bioactive polymers (NMBP) in food packaging. CO 3: Description of modern packaging systems such as green plastics for food packaging.
Food Analysis (FST-606)	CO 1: To develop an understanding and methodologies of instrumental techniques in food analysis. CO 2: Application and operating parameters of a spectrophotometer, AAS, GC, HPLC, NMR, FTIR, GC-MS, LC-MS.
Food Quality Systems & Management (FST 607)	CO 1: To acquaint with food quality parameters and control systems, food standards, regulations, specifications. CO 2: Concepts of Total Quality Management, sanitary and hygienic practices. CO 3: Description of laboratory quality procedures and assessment of laboratory performance.
Confectionary Technology (FST 630)	CO 1: To provide an understanding of various classes of confectionary products, their manufacture, and quality aspects. CO 2: Description of chocolate processing technology, sugar confectionery manufacture, and flour confectionery.
Statistical Methods for Food Science (FST 531)	CO 1: Exposure to various statistical tools required to analyze the experimental data in food research and industry. CO 2: Descriptive statistics, estimation, and confidence intervals hypothesis testing.
Intellectual Property and Its Management in Agriculture (PGS-503)	CO 1: To equip students and stakeholders with knowledge of intellectual property rights (IPR), related protection systems, their significance, and the use of IPR as a tool for wealth and value creation in a knowledge-based economy.

	CO 2: Learning of Indian legislations for the protection of various types of intellectual properties.
Basic Concepts in Laboratory Techniques (PGS-504)	CO 1: To acquaint the students with the basics of commonly used techniques in the laboratory. CO 2: Preparation of solutions of acids, bases, buffers, tissue culture, etc.
<b>M. Tech. 3<sup>rd</sup> semester</b>	
Advances in Food Engineering (FST-603)	CO 1: To acquaint with recent advances in food engineering and its processes. CO 2: Engineering properties of foods, their significance in equipment design. CO 3: Theory of ultra-filtration and reverse osmosis.
Equipment Design & Process Control (FST 608)	CO 1: To introduce basic equipment design and various process control mechanisms and related engineering aspects. CO 2: Design of vessels, food storage tank, and heat exchangers. CO 3: Instrument terminology, performance system accuracy, and introduction to programmable logic controllers (PLC).
Nutraceuticals & Health Foods (FST 612)	CO 1: To cater to the newly emerging area of nutraceuticals with respect to the types and mechanisms of action. CO 2: Description of the manufacturing process of selected nutraceuticals, product development, clinical testing, and toxicity aspects.
Business Management & International Trade (FST-533)	CO 1: To acquaint with techniques of business management & international trade for the food sector. CO 2: Concept and functions of marketing, market measurement, and advertising.
Master's seminar (FST 591)	CO 1: To develop presentation skills among students CO 2: Presentation and discussion by each student on current topics/interests in Food Processing Technology
Agricultural Research, Research Ethics and Rural Development Program (PGS 505)	CO 1: To enlighten the students about the organization and functioning of agricultural research systems at national and international levels CO 2: research ethics, and rural development programs and policies of Government.
Disaster Management (PGS 506)	CO 1: To introduce learners to the key concepts and practices of natural disaster management; CO 2: To equip them to conduct a thorough assessment of hazards, and risks vulnerability; and capacity building.
<b>M. Tech. 4<sup>th</sup> semester</b>	



Industrial Training (FST 590)	<p>CO 1: In-plant Training is intended to expose the students to an environment in which they are expected to be associated in their future careers.</p> <p>CO 2: The students will gain hands-on experience in one or more commercial establishments.</p>
Master Research (FST 699)	<p>CO 1: To investigate selected problems of special interests in Food Technology by individual students.</p> <p>CO 2: The work includes library work, field or laboratory research, recording data, analyzing data, and writing of a dissertation.</p>

## Ph.D. Food technology

<b>Program outcomes</b>	<p>PO 1: Substantive knowledge in an area of concentration that allows for application to a relevant area of food science.</p> <p>PO 2: Application of critical thinking to food components and complex food systems including experimental design and completion of experiments.</p> <p>PO 3: Produce and defend an original significant contribution to knowledge.</p> <p>PO 4: Demonstrate mastery of subject material through a thesis defense and preparation of one or more manuscripts for peer review in a scientific journal (s).</p> <p>PO 5: Conduct scholarly or professional activities in an ethical manner.</p> <p>PO 6: Develop teaching skill as a Teaching Assistant.</p>
<b>Program specific outcomes</b>	<p>PSO 1: To get research opportunities in multiple fields including Nutrition, Dietetics, Food Chemistry, Toxicology, etc.</p> <p>PSO 2: The research related to Food Science and Technology has a very high demand. With the growing health awareness, the demand for this research is expected to grow more in the future.</p> <p>PSO 3: The students get ample job opportunities in government research centers, food quality testing centers, etc.</p> <p>PSO 4: The candidates get opportunities to work as faculty members (professors and lecturers) in both government and private colleges and universities.</p> <p>PSO 5: The candidates with Ph.D. Food Technology gets opportunities to start their start-ups in the form of laboratories, Research Centres, Nutrition clinics, etc.</p>
<b>Course outcomes</b>	
<b>Courses</b>	<b>Outcomes</b>
<b>Research Methodology (FT-609)</b>	<p>CO 1: Learning of different methodologies and techniques used in research work.</p> <p>CO 2: To know the basic computer skills necessary for the conduct of research.</p> <p>CO 3: To understand the basic function and working of analytical instruments used in research</p> <p>CO 4: Understanding of required numerical skills necessary to carry out research.</p>
<b>Advances in Food Analysis and Quality Control (FT-611)</b>	<p>CO 1: To develop an understanding of the advanced analytical and instrumental techniques.</p> <p>CO 2: To illustrate the principle and mechanism of analytical instruments.</p>

	CO 3: To describe the bio-chemical analysis of food components.
<b>Recent Advances in Cereals, Pulses &amp; Oilseeds Processing (FT-612)</b>	CO 1: To understand the storage and handling of food grains. CO 2: To illustrate quality testing of wheat grain and the milled product (flour, dough, etc.). CO 3: To acquaint with the milling techniques of cereals such as wheat, rice, maize, pseudocereals, and pulses and extraction of oil from oilseeds. CO 4: To identify the problems associated with the milling of grains and their solution. CO 5: To know the techniques for processing food grains into value-added products.
<b>Recent Advances in Fruits &amp; Vegetables Processing (FT-613)</b>	CO 1: To illustrate the relationship of the Indian economy concerning the fresh and processed fruits and vegetables and their spoilages. CO 2: To acquaint with the post-harvest handling technologies of fruits and vegetables to reduce postharvest losses and their value addition. CO 3: To illustrate the technological advances in thermal processing of fruit and vegetable. CO 4: To acquaint with advances in byproduct utilization.
<b>Recent advances in Food Processing and Technology (FT-614)</b>	CO 1: To illustrate the techniques involved in food processing such as Microwave and Radio Frequency Processing, High-Pressure processing, Ultrasonic Processing, etc. CO 2: To acquaint with principles and applications of Hurdle Technology. CO 3: To illustrate the newer techniques such as high-intensity light, pulsed electric field, ohmic heating, IR heating, inductive heating, and pulsed X-rays in food processing and preservation.
<b>Recent Advances in Dairy Science &amp; Technology (FT-615)</b>	CO 1: To illustrate the technologies of processing milk and milk products. CO 2: To describe the design and working of equipment used in dairy science & technology. CO 3: To elucidate the thermal processing of milk and quality changes therein. CO 4: To explain the manufacturing processes of dairy products, and by-products as well as the hygiene and sanitation practices in a milk plant.
<b>Recent Advances in Food</b>	CO 1: To describe the status of biotechnology in India about

<b>Biotechnology (FT-616)</b>	<p>food technology and its general applications.</p> <p>CO 2: To illustrate the processes of fermentation and fermenter design as well as production of alcoholic beverages.</p> <p>CO 3: To acquaint with genetic engineering and genetically modified foods and their safety concerns.</p>
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## Programme outcomes, Programme specific outcomes and course outcomes

### Ph.D. Horticulture (Vegetable Science)

<b>Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. After doing Ph.D. in Horticulture (Vegetable Science) the student becomes eligible to be appropriate for employment offered by Agricultural universities for distinct posts from the concerned field of their specialization as Assistant Professor, Scientist, quality control officer, farm manager, breeder, seed analyst etc.</li> <li>2. Indian Council of Agricultural Research and Department of Science and Technology (DST) also engage students in different posts according to their requirement.</li> </ol>
<b>Programme specific outcomes</b>	<ol style="list-style-type: none"> <li>1. Students having a combined knowledge of Vegetable Science with entrepreneurial skills enable them to get administrative or marketing positions with organizations involved in the processing and marketing of vegetables, they also get recruited in the companies as horticulturists, gardeners, supervisors, farm or estate managers, handling large scale production of certain varieties of vegetables in various private seed companies etc.</li> <li>2. Many fertilizer and pesticide companies engage students in their firms where they work as managers.</li> <li>3. At the International level, different agencies appoint horticultural consultants.</li> <li>4. And other different positions as per their requirement.</li> </ol>
<b>Course Ph.D Horticulture (Vegetable Science) Outcomes</b>	
<b>VSC-601(Advances in Vegetable Production)</b>	<ul style="list-style-type: none"> <li>❖ This course will keep the students up to date on the latest advancements and trends in vegetable crop production technologies.</li> <li>❖ Students will be able to classify vegetables according to their climatic suitability by season and examine various cropping methods in a variety of settings.</li> <li>❖ Utilize their expertise of vegetable growing to meet the needs of industry, as well as manage and recycle vegetable waste.</li> </ul>
<b>VSC-602(Advances in Breeding of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ It contains current information on contemporary research trends in the field of vegetable crop breeding, with a focus on tropical, subtropical, and temperate vegetables grown in India.</li> <li>❖ Students will be able to describe the ideas and procedures used in vegetable crop breeding after taking this course.</li> <li>❖ Identify constructive ways in hybrid seed development by discussing breeding strategies and achievements in vegetable crops.</li> <li>❖ Apply advanced breeding techniques to vegetable crops.</li> </ul>
<b>VSC-603 (Protected Cultivation of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ It will provide students with the most up-to-date information on growing vegetable crops in protected environments, as well as establish the core concept of protected farming.</li> <li>❖ Examine the various forms of protected structures.</li> <li>❖ Manage the crops that are grown in enclosed structures.</li> <li>❖ Describe how environmental conditions affect the growth of vegetable crops and to develop knowledge on how to cultivate vegetables in a protected environment and to plan an integrated disease and pest management programme in a protected structure.</li> </ul>
<b>VSC-604 (Biotechnology of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ Advances in biotechnology for vegetable crop development are covered in this course which will enable the students to show the establishment of tissue grown plants after completing this course.</li> <li>❖ Demonstrate how tissue culture can be used to grow vegetable crops.</li> </ul>

	<ul style="list-style-type: none"> <li>❖ Describe how biotechnology is used in vegetable crops.</li> <li>❖ Develop horticultural agricultural biotechnology abilities and discuss the role of molecular markers and recombinant DNA technology.</li> </ul>
<b>VSC-605 (Seed Certification, Processing and Storage of Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ The students will be acquainted with importance of quality seed production, various methods of seed production in self and open pollinated vegetable crops their storage and certification.</li> </ul>
<b>VSC-606 (Abiotic Stress Management in Vegetable Crops)</b>	<ul style="list-style-type: none"> <li>❖ It will keep the students up to date on the latest research in the field of horticultural crop biotic and abiotic stress management.</li> <li>❖ Students will be able to detect several types of biotic and abiotic stress in horticultural crops after completing this course.</li> <li>❖ Illustrate crop factors or causes and impact of biotic and abiotic stress.</li> <li>❖ Discuss different stress management and mitigation practices of plant and to develop strategies for improvement of Horticultural Crops against stresses.</li> </ul>
<b>VSC-691 (Doctoral Seminar-1 )</b>	<ul style="list-style-type: none"> <li>❖ Course will develop skill on review work on the background of area of research through secondary information available.</li> <li>❖ Through this course students will be able to define applications of given topics.</li> <li>❖ Integrate the concept developed during study with situations given and observe the situations provided and develop the presentation.</li> <li>❖ Demonstrate the finding of study carried out.</li> </ul>
<b>VSC-692 (Doctoral Seminar-2 )</b>	<ul style="list-style-type: none"> <li>❖ Describe suitable review of literatures related to research parameters.</li> <li>❖ Tabulate the available information for reflecting the outcomes.</li> </ul>

## **Course Outcomes of Biotechnology**

### **SEMESTER I**

Subject Code: BT-501

Course Title: Cell and Molecular Biology

Evolution of cell and biological macromolecules, general features of

CO 1. Give introduction to prokaryotic and eukaryotic cells

CO 2. Describe structure and function of plasma membrane, molecular organization of cytoskeleton and functions of different cell organelles.

CO 3. Explain Chromosome organization, chromatin structure, complexity of eukaryotic chromosome, cot curve.

CO 4. Explain cell division and cell cycle

CO 5. Describe DNA replication in prokaryote and eukaryotes.

CO 6. Describe transcription process in prokaryote and eukaryotes

CO 7. Give a detailed account of translation process of prokaryote and eukaryotes.

Subject Code: MICRO-511

Course Title: General Microbiology

CO 1. Write down history and scope of microbiology

CO 2. Explain characterization, classification and identification of microorganisms, microscopic examination of microorganisms.

CO 3. Describe fine structure and morphology of bacteria, reproduction and cultivation, mixed and pure culture.

CO 4. Explain Microbial physiology and bacterial genetics.

CO 5. Describe viruses, bacteriophages and control of microorganisms (physical and chemical agents)

CO 6. Explain biological fixation of nitrogen.



CO 7. Explain the different, resistance and defense mechanisms in host pathogen interactions.

Subject Code: BIOCHEM-511

Course Title: General Biochemistry

CO 1. Give fundamental principles that governs life.

CO 2. Explain structure and function of biomolecules.

CO 3. Explain enzyme classification and enzyme kinetics in detail.

CO 4. Give a detailed account for photosynthesis and photorespiration.

CO 5. Explain glucose metabolism in plants.

CO 6. Describe Lipid metabolism.

CO 7. Write down the nutritional aspects of carbohydrates, lipids, proteins and minerals, hormones.

Subject Code: BT-504

Course Title: General Genetics

CO 1. Give chromosome structure and organization, gene structure in detail.

CO 2. Explain concepts of inheritance, Mendelian principles of genetics, applications of Mendelian principles.

CO 3. What are chromosomal basis of inheritance and linkage?

CO 4. Describe replication of genetic material and central dogma.

CO 5. What are numerical and structural chromosomal changes?

CO 6. What do you understand by population and evolutionary genetics.

CO 7. Explain different types of genetic disorders and genetic counseling.

Subject Code: BT-505

Course Title: Computational Biology & Biostatistics

- CO 1. Explain the concepts of variables in biological systems, collection, classification, tabulation, graphical and diagrammatic representation of numerical data.
- CO 2. Explain the measure of central tendency, measure of dispersion, correlation and regression.
- CO 3. Explain test of significance based on Z,  $\chi^2$ , t and F statistics, correlation.
- CO 4. Describe Laboratory Information management systems (LIMS).
- CO 5. Describe different different protein data bases and hteir functions.
- CO 6. Give details regarding sequence analysis using bioinformatics toosl.
- CO 7. Explain gene finding algorithms and models.
- CO 8. Describe Protein-Protein interactions and microarrays chips and data analysis.

Subject Code: BT-506

Course Title: Techniques in Biotechnology-I

- CO 1. Perform experiments for the detection of carbohydrates, amino acids, and proteins.
- CO 2. Perform SDS-PAGE for protein separation
- CO 3. Perform the isolation of bacteria from different sources (soil, water and air)
- CO 4. Identify the isolated bacterial colonies using microscopic and staining techniques, plotting growth curve from isolated bacterial strain.
- CO 5. Prepare slides and observe different stages for Mitosis and meiosis.
- CO 6. Explain the inheritance and linkage analysis
- CO 7. Solve the given numerical of ANOVA and chi square test.

## **SEMESTER II**

Subject Code: BT-507

Course Title: Plant and Animal Biotechnology

- CO 1. Write down about historical perspectives of plant biotechnolgoy.

- CO 2. Explain various methods of *in vitro* propagation in plants.
- CO 3. Describe Protoplast isolation, culture and applications of somatic hybridization.
- CO 4. Describe the significance of plant cell suspension culture in p production of secondary metabolites.
- CO 5. Describe various methods if gene transfer.
- CO 6. Give a detailed account of various molecular markers used in crop improvement.
- CO 7. Give different types of culture media and cell cultures.
- CO 8. Explain *in vitro* fertilization and embryo transfer technique in detail.

Course No. BT 508

Course Title: Cell Communication and Cell Signaling

- CO 1. What do understand by Host parasitic relationship?
- CO 2. What are different Polar/Non Polar Signaling molecules?
- CO 3. Enumerate the role of different kind of receptors present on Cells.
- CO 4. Explain the different Cell –Cell, Cell Matrix and Cell Basal Lamella interactions.
- CO 5. Give a detailed account of Cancer, Types of Cancer, Tumour suppressor Genes and Oncogenes
- CO 6. Explain Apoptosis, Necrosis and Cell Cycle and relate them with Cancer.

Subject Code: BT-509

Course Title: Instrumental methods of Analysis

- CO 1. Explain different types of microscopy.
- CO 2. Describe different aspects of radioisotopy and its applications.
- CO 3. Explain different types of chromatography and its applications.
- CO 4. What is electrophoresis and expalin the principle and functioning of 2D PAGE.
- CO 5. Explain different methods of DNA sequencing.

CO 6. What is Spectroscopy and explain different types of spectroscopy.

Subject Code: BT-510

Course Title: Immunology

CO 1. Describe different types of immunity and cells associated with immune system.

CO 2. Explain different aspects of antibody, structure and functions.

CO 3. Write down the role of different MHC in immune system and

CO 4. Describe different types of Hypersensitivity reactions and regulation of IgE, mast cells, basophils and allergy.

CO 5. Describe the complement system- and its different pathways.

CO 6. Describe hybridoma technology and production of monoclonal antibody production.

CO 7. Describe different immunological techniques to study antigen antibody reactions.

CO 8. Explain different autoimmune disorders.

Subject Code: BT-511

Course Title: Bioprocess Engineering and Technology

CO 1. Describe isolation, preservation and maintenance of industrial microorganisms and their kinetics.

CO 2. Write down about analysis of batch, fed-batch and continuous bioreactions, stability of microbial reactors, analysis of mixed microbial populations.

CO 3. Describe neural networks, mathematical modeling, role of computers in bioprocess control and applications.

CO 4. What is whole cell immobilization and their industrial applications.

CO 5. Give detailed account of industrial production of ethanol, citric and acetic, glycerol, butanol and penicillin.

CO 6. amino acids (lysine, glutamic acid), vitamins and single cell proteins- algal, fungal and yeast biomass.

CO 7. Describe the applications of microorganisms in mineral and oil recovery

Subject Code: BT-512

Course Title: Techniques in Biotechnology-II

CO 1. Perform the isolation of genomic and plasmid DNA

CO 2. Perform quantification of DNA through agarose gel electrophoresis techniques and spectrophotometer based DNA quantification

CO 3. Perform PCR and molecular marker analysis

CO 4. Perform Restriction enzyme digestion

CO 5. Selection of recombinants using blue/white colony selection.

CO 6. Perform cell and explant culture, subculturing and regeneration, Embryo rescue, Anther culture

Genetic transformation through particle bombardment, GUS assay.

CO 7. Perform Immunoelectrophoresis; Enzyme immunoassays including ELISA.

CO 8. Isolate industrially important microorganisms for microbial processes.

CO 9. estimate production and estimation of alkaline protease.

### **SEMESTER III**

Subject Code: BT-513

Course Title: Genetic Engineering

CO 1. Define artificial chromosomes. Draw a well labeled diagram of YAC and explain its functioning.

CO 2. Explain the extraction of RNA from plants using a flow chart.

CO 3. What is protein-protein interaction? Explain its different methods.

CO 4. Explain heterologous expression in *E.coli* and Yeast.

CO 5. Distinguish between genomic DNA and cDNA library.

CO 6. Explain different methods of next generation sequencing with the help of suitable diagrams.

CO 7. Give an introduction to various components and steps of PCR.

CO 8. How would you check success of a PCR reaction and in case of undesired results what

kind of changes in reaction and process conditions should be tried for further reactions?

CO 9. Give various examples of genetic manipulation in animals and plants. Explain the risk and safety aspects associated with genetic engineering.

Subject Code: BT-514

Course Title: Enzymes and Enzyme Technology

CO 1. Explain nomenclature and classification of enzymes

CO 2. Describe various aspects of enzymology.

CO 3. Describe enzyme extraction, purification, assay and analysis of enzymes

CO4. Describe enzyme kinetics in detail.

CO 5. Explain mechanism of enzyme catalysis.

CO 6. What is cooperativity and its role in enzymology.

CO 7. Give a detailed account regarding clinical aspects of enzymes.

Subject Code: BT-515

Course Title: Biosafety, Bioethics & IPR

CO1. Explain the role of biosafety in human health and environment.

CO 2. Describe biosafety and risk assessment issues, biosafety guidelines and regulatory framework,

CO 3. What are National biosafety policies and law, The Cartagena Protocol on biosafety, WTO and other international agreements related to biosafety, risk management issues- containment.

CO 4. What are general principles for the laboratory and environmental biosafety.

CO 5. Explain regulatory affairs for drugs and biologicals.

CO 6. What are the different effects of GMOs on biodiversity and human health.

CO 7. What are the different aspects of IPR.

Subject Code: BT-516

Course Title: Techniques in Biotechnology-III

CO 1. Perform isolation of plasmid DNA.

CO 2. Perform restriction digestion of plasmid DNA and electrophoresis.

CO 3. Perform ethidium bromide staining and gel documentation.

CO 4. Perform cloning DNA in a pBlueScript vector.

CO 5. Perform Polymerase chain reaction and resolution of amplicons Sequencing methods.

CO 6. Study the effect of pH and temperature on enzyme activity and stability Enzyme kinetics analysis.

Optional Subject Code: BT-518

Course Title: Food Biotechnology

CO 1. explain the microbial spoilage of different food types and agents responsible for the spoilage.milk, meat, plant products.

CO 2. Describe different fermented and microbial foods in detail.

CO 3. Describe various techniques for microbiological examination of foods.

CO 4.. What are different food preservation techniques.

CO 5. What are the different measures taken for quality control of food products.

- CO 6. Describe different myths and facts associated with food biotechnology,  
CO 7. Explain about recombinant DNA technology derived food benefits and safety guidelines.

Optional Subject Code: BT-519

Course Title: Plant Molecular Breeding

- CO 1. Write down the methods of breeding in P self and cross- pollinated crops.  
CO 2. Give a detailed account for sequence based markers.  
CO 3. what are the advanced methods of genotyping?  
CO 4. What is QTL mapping? Describe AB-QTL analysis and fine mapping of gene/QTL.  
CO 5. Describe the complete mechanism and principle associated with TILLING and Eco-TILLING  
CO 6. What are the different aspects of marker assisted selection.

Optional Subject Code: BT-523

Course Title: Environmental Biotechnology

- CO 1. Explain the different types of pollutions and their impact on environment.  
CO 2. Describe waste water management and different treatment system associated with it.  
CO 3. Describe solid waste management and different treatment schemes associated with it.  
CO 4. Explain various bioremediation and phytoremediation strategies for biodiversity and its conservation.  
CO 5. What are different renewable and non-renewable resources of energy.  
CO 6. What is environmental protection act and different environmental laws and policies.

Optional Subject Code: BT-524

Course Title: Microbial Biotechnology

- CO 1. Explain isolation and preservation of industrially important microorganisms.  
CO 2. Describe different aspects of genomics and transcriptomics of microorganisms.  
CO 3. Explain metagenomics and systems biology study in microorganisms.  
CO 4. Describe production of proteins and enzymes in different microorganisms.  
CO 5. Explain the role of microorganisms as biocontrol agent.  
CO 6. Describe biological nitrogen fixation.  
CO 7. What are applications of microbes in environmental biotechnology.

**Subject Code: BT-600**

**Dissertation**

- CO1 Writing synopsis and objectives for proposed research work.  
CO2 Study of Literature, generation of data.  
CO3 Presenting the data and outcomes at different platforms.  
CO4 Writing thesis/report.  
CO5 Writing research articles and conference presentations. '

**Subject Code: BT-701**

**Dissertation**

- CO1 Writing synopsis and objectives for proposed research work.  
CO2 Comprehensive examination and Viva Voce  
CO3 Study of Literature, generation of data.



CO4 Presenting the data and outcomes at different platforms.

CO5 Writing thesis/report.

CO6 Writing research articles and conference presentations. '

### **2.6.1 Program Outcomes (M.Sc. and Ph.D. Biotechnology):**

**P01:** Trained Manpower: The post graduate in biotechnology is trained in array of biotechnological tools and techniques including molecular biology and genetic engineering for their intended applications.

**P02:** Plant tissue culture based germplasm conservation: The micropropagation techniques can be used for germplasm conservation, rapid multiplication of plants, production of secondary metabolites, making synthetic seeds etc.

**P03:** Quality control: Knowledge of microbiological criterias through food biotechnology and microbiological techniques along with biosafety principles are useful in development of skills for quality control in biotechnology/pharmaceutical industry.

**P04:** Research aptitude: The specific training through intensive research work for six months during masters' dissertation (and 3 years for doctoral dissertation) and a continuous research exposure in state of art research laboratories is boon for understanding key research activities and developing a positive attitude towards research. The research methodology course is considered as a value addition to it.

**P05:** Designing experiments and troubleshooting: The research training based on specific objectives includes designing and performing experiments leading to data generation. The problems encountered during experimentation needs to resolved thus generating troubleshooting skills.

**P06:** Team work: Ability to work in matrix environment (both PG and Ph.D. Students) not only increases the knowledge but also leads to the development of team spirit among researchers.

**P07:** Knowledge and use of advanced techniques: With major emphasis on tools and techniques this course provides an in depth understanding about their principles and application. Further, the hands on training on these techniques generate confidence and develop skills for employability.

**P08:** Data analysis and Literature survey: As an integral part of curricula the literature survey for proposed research work and given assignments followed by analysis of generated research data provides a good and useful training as a life long learning experience for its utilization.

#### **2.6.1 Program specific outcomes:**

**PSO1** Understanding the molecular biology concepts and their application in various biotechnological investigations.

**PSO2** Knowledge of bio-molecules and their utility in biological systems.

**PSO3** In depth knowledge of genetics and molecular breeding for its application in crop improvement and other biotechnological interventions.

**PSO4** To understand and apply genetic engineering tools and techniques for sustainable development.

**PSO5** To gain the knowledge regarding biosafety guidelines, ethical issues and intellectual property in biotechnology industries.

**PSO6** To develop skill for analyzing the data and sequence outcomes of the biotechnological research using modern bioinformatics and statistical tools.

**PSO7** Utilization of microbes for beneficial applications.

**PSO8** understanding about enzymes, their characteristics features and applications in biotechnology.

#### **2.6.2 Attainment of PO, PSO and CO:**

The methods for measurement of the PO, PSO and CO are as follows:

1. Conducting and evaluating first and second sessional examinations
2. Giving assignments based on specific COs or POs followed by presentation and

evaluation.

3. Designing a research problem and writing a synopsis for proposed work for approval by research committee.

4. Presentations through class seminars and credit seminar.

5. Internal assessment based on daily performance in practical classes

6. Pre- thesis seminar for presenting the research outcome during dissertation.

7. Writing a thesis and its external evaluation by expert in the subject (for PG and Ph.D. Students).

8. For Doctoral students comprehensive examination followed by Viva-Voce by an external examiner is mandatory during the research period.

## **AKAL COLLEGE OF ARTS & SOCIAL SCIENCE (ACASS)**

### **B.Sc. (Hons. with Research) Psychology**

#### **2. Program Education Objectives (PEO's)**

The learning objectives of B.Sc. (Hons) Psychology students are:

<b>PEO No.</b>	<b>Education Objective</b>
<b>PEO 1</b>	A thorough grasp of core principles, theories, and concepts in psychology across multiple subfields.
<b>PEO 2</b>	Attain proficiency in research methodologies, including experimental design, data analysis, and interpretation, along with the ability to conduct independent research projects.
<b>PEO 3</b>	Foster critical thinking skills to analyze, evaluate, and synthesize psychological theories and research findings, enabling evidence-based problem-solving.
<b>PEO 4</b>	Understand ethical principles in psychological research and practice, demonstrating ethical decision-making in interactions with clients and colleagues.
<b>PEO 5</b>	Enhance communication skills to convey psychological concepts, research findings, and interventions professionally and empathetically to diverse audiences.
<b>PEO 6</b>	Gain hands-on experience through internships, practicums, or research projects to apply theoretical knowledge in real-world settings and develop practical counseling and intervention skills.
<b>PEO 7</b>	Engage in activities like attending conferences, workshops, and seminars, joining professional organizations, and seeking mentorship for lifelong learning and growth in psychology.

<b>PEO 8</b>	Develop awareness of cultural diversity's impact on behavior and psychological processes, enabling effective work with individuals from diverse backgrounds and demonstrating cultural sensitivity in professional practice.
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### 3. Graduate Attributes

Sr. No.	Graduate Attribute	Description
1.	Comprehensive Understanding	Graduates should possess a comprehensive understanding of the core principles, theories, and methodologies within psychology, spanning various subfields such as cognitive psychology, developmental psychology, social psychology, and more. This entails a deep knowledge base that enables them to analyze and interpret complex psychological phenomena.
2.	Research Skills	Graduates should demonstrate proficiency in research methodologies, including experimental design, data collection, statistical analysis, and interpretation of findings. They should be capable of critically evaluating existing research literature and conducting independent research projects within the field of psychology.
3.	Critical Thinking and Analysis	Graduates should possess strong critical thinking skills, enabling them to analyze, evaluate, and synthesize psychological theories, research findings, and real-world applications. They should be adept at identifying and solving problems through logical reasoning and evidence-based approaches.
4.	Ethical Awareness	Graduates should have a thorough understanding of ethical principles and guidelines in psychological research and practice. They should be able to identify ethical issues, adhere to professional codes of conduct, and demonstrate ethical decision-making in their interactions with clients, participants, and colleagues.
5.	Effective Communication	Graduates should demonstrate effective communication skills, both orally and in writing, to convey psychological concepts, research findings, and therapeutic interventions to diverse audiences. They should be capable of communicating professionally and empathetically in various professional contexts.



6.	Practical Experience	Graduates should have gained practical experience through internships, practicums, or research projects, allowing them to apply theoretical knowledge in real-world settings. They should have developed practical skills in counseling, assessment, intervention, and consultation under the supervision of experienced professionals.
7.	Professional Development	Graduates should engage in activities that promote personal and professional development, such as attending conferences, workshops, and seminars, participating in professional organizations, and seeking mentorship. They should demonstrate a lifelong commitment to learning and growth in the field of psychology.
8.	Global and Cultural Competence	Graduates should develop awareness and appreciation of cultural diversity and its impact on human behavior and psychological processes. They should be able to work effectively with individuals from diverse backgrounds and demonstrate cultural sensitivity and competence in their professional practice.

#### 5. Program Outcome (PO's)

PO No.	Program Outcome	Attributes	Competencies
PO1	Comprehensive Understanding	Deep understanding of psychological principles and theories across subfields	Ability to analyse and synthesize psychological concepts and theories
PO2	Research Proficiency	Proficiency in research methodologies	Conducting independent research projects - Critical evaluation of research literature
PO3	Critical Thinking and Analysis	Strong critical thinking skills	Analytical reasoning - Problem-solving
PO4	Ethical Awareness	Understanding of ethical principles	Ethical decision-making - Adherence to professional codes of conduct
PO5	Effective Communication	Effective oral and written communication	Professional communication skills - Empathetic communication
PO6	Practical Experience and Professional Development	Personal and professional growth/Application of theoretical knowledge in real-world Setting	Engagement in professional activities (e.g., conferences, workshops) - Lifelong learning/Counselling Skills-Assessment and Intervention Techniques
PO7	Global and Cultural Competence	Cultural sensitivity and competence	Ability to work with diverse populations - Cross-cultural communication skills

## 6. Program Specific Outcome (PSO's)

PSO No	Competency
PSO1	Students will demonstrate advanced knowledge and understanding in specific areas of psychology, such as cognitive psychology, developmental psychology, social psychology, or clinical psychology.
PSO2	Students will be able to design and conduct independent research projects in psychology, including formulating research questions, selecting appropriate methodologies, collecting, and analysing data, and communicating research findings effectively
PSO3	Students will apply psychological theories and concepts to analyse real-world issues, critically assessing their relevance and applicability across diverse contexts. They will engage in ongoing professional development through workshops, conferences, seminars, and continuing education programs, while seeking supervision and mentorship from experienced professionals to enhance their knowledge and skills in psychology.
PSO4	Students will uphold ethical guidelines and principles in academic and professional endeavours, displaying integrity, confidentiality, and ethical sensitivity in research, assessment, and intervention. They will exhibit cultural competence, working effectively with diverse populations and integrating cultural considerations into psychological practice.
PSO5	Students will effectively communicate complex psychological concepts, research findings, and therapeutic interventions both orally and in writing to diverse audiences, including clients, colleagues, and the public. They will apply their psychological knowledge and skills in practical settings, demonstrating proficiency in assessment, diagnosis, treatment planning, and intervention.



## SEMESTER – I

Unique Code	Course Type	Course Title
0270311011	DSC-1	Foundational Psychology-I
0270311021	DSC-2	Social Psychology
0270311030	DSC-3	Paradigms of Psychology

<b>Name of the Department</b>	Psychology
<b>Name of the Program</b>	B.Sc. (Hons. With Research) Psychology
<b>Unique Code</b>	0270311011
<b>Course Title</b>	<b>Foundational Psychology-I</b>
<b>Academic Year</b>	2024-2025
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	This course will strengthen the foundation and spark interest in psychology as a field. Students will get knowledge about psychology's concept, background, methods and many schools of thought. Additionally, students will learn about the various processes involved in sensation, perception, emotions and motivation. They will also be able to apply these concepts to their own lives and the lives of others.
<b>Course Outcomes:</b>	
At the end of the course, students will be able to:	
<b>CO1</b>	Learn about the fundamental processes and core psychological concepts, and different methods used in the field of psychology
<b>CO2</b>	Develop an understanding of the different methods of psychology and will able to utilize various methods in the practical world.
<b>CO3</b>	Understand the phenomenon of attention & perception and develop a base in cognitive psychology with the help of relevant examples of everyday life.
<b>CO4</b>	Develop the understanding of theories of motivation & emotions and their influence on individual and social behavior. Critically assess prominent theories of emotions and initiate the importance of positive emotions in day to day life
<b>CO5</b>	Expanded knowledge of various assessment procedures regarding conduction of experiments and develop the Ability to administer, analyse and interpret results from various psychological tools.



Name of the Department	Psychology											
Name of the Program	B.Sc. (Hons. With Research) Psychology											
Unique Code	0270311030											
Course Title	Paradigms of Psychology											
Academic Year	2024-2025											
Semester	I											
Number of Credits	4											
Course Prerequisite												
Course Synopsis	This course provides an introduction to the fundamental paradigms of psychology, exploring various theoretical frameworks and their applications in understanding human behavior. Through interactive lectures, discussions, and practical tutorials, students will gain a comprehensive understanding of different psychological perspectives and their significance in the Indian context.											
Course Outcomes:												
At the end of the course, students will be able to:												
CO1	Demonstrate an understanding of the major paradigms in Psychology, including Behaviourism, Psychoanalysis, Humanistic Psychology, and socio-cultural perspective.											
CO2	Students will analyse and evaluate the strengths and limitations of each Psychological paradigm in explaining human behaviour.											
CO3	Students will be able to apply Psychological theories and concepts to real-world scenarios, particularly within the Indian cultural context.											
CO4	Develop Critical thinking and research skills through practical tutorials and hands-on activities.											
CO5	Expanded knowledge through various activities regarding the practical application of different paradigms of psychology and their application in real world.											
Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	3	3	0	2	3	3	0	3	2	1
CO2	3	1	2	3	0	1	3	2	1	2	3	2
CO3	1	3	0	3	0	3	3	1	1	2	3	2
CO4	1	3	3	1	0	3	0	1	3	1	2	3
CO5	0	0	0	0	0	0	0	0	0	0	0	0
Average	2	2	2	2.5	0	2.25	2.25	1.75	1.25	2	2.5	2



## SEMESTER – II

Unique Code	Course Type	Course Title
0270321041	DSC-1	Foundational Psychology-II
0270321051	DSC-2	Developmental Psychology
0270321061	DSC-3	Abnormal Psychology

Name of the Department	Psychology											
Name of the Program	B.Sc. (Hons. With Research) Psychology											
Unique Code	0270321041											
Course Title	Foundational Psychology-II											
Academic Year	2024-2025											
Semester	II											
Number of Credits	4											
Course Prerequisite												
Course Synopsis	The students will gain knowledge of the basic procedures and essential psychological ideas, models, traditional theories, and other viewpoints. They will able to learn about the fundamental processes and core psychological concepts, models, classical theories, varied perspectives, and will be able to apply them in their own and in others’ lives. It will also give the learner a clear understanding of the concepts like intelligence, personality, learning memory and forgetting.											
Course Outcomes:												
At the end of the course students will be able to:												
CO1	Students will understand the concept of intelligence and its importance											
CO2	Developing an understanding of the concept of individual differences and various approaches to personality and appreciating the diverse frameworks											
CO3	Gain knowledge and appreciate various theories of learning and other aspects of human behaviour in the practical world.											
CO4	Identify the importance of experiments in the field of memory and how it shapes cognitive functions at large and their impact on human psychology											
CO5	Expanded knowledge of various assessment procedures regarding conduction of experiments and develop the Ability to administer, analyse and interpret results from various psychological tools.											
Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5

CO1	3	0	3	3	2	3	3	1	1	2	2	2
CO2	2	0	2	2	0	2	2	1	1	2	1	1
CO3	2	0	2	2	1	3	2	2	1	3	3	2
CO4	1	1	2	2	2	2	2	2	0	1	1	1
<b>Average</b>	<b>2</b>	<b>0.25</b>	<b>2.25</b>	<b>2.25</b>	<b>1.25</b>	<b>2.5</b>	<b>2.25</b>	<b>1.5</b>	<b>0.75</b>	<b>2</b>	<b>1.75</b>	<b>1.5</b>
1= Weak Correlation			2= Moderate Correlation					3= Strong Correlation				

Name of the Department	Psychology											
Name of the Program	B.Sc. (Hons. With Research) Psychology											
Unique Code	0270321051											
Course Title	Developmental Psychology											
Academic Year	2024-2025											
Semester	II											
Number of Credits	4											
Course Prerequisite												
Course Synopsis	This course provides an overview of the Psychological processes that occur throughout the lifespan, from infancy to old age. Emphasis is placed on understanding the physical, cognitive, emotional, and social changes that individuals experience as they age. The course explores various theories of development and examines how genetics, environment, and culture influence growth and behavior.											
Course Outcomes:												
At the end of the course students will be able to:												
CO1	Understand the major theories and concepts in developmental psychology.											
CO2	Identify and analyse the physical, cognitive, emotional, and social changes that occur across the lifespan.											
CO3	Evaluate the influence of genetics, environment, and culture on development.											
CO4	Examine the role of family, peers, and society in shaping individual’s development.											
CO5	Expanded knowledge of various assessment procedures regarding conduction of experiments and develop the Ability to administer, analyse and interpret results from various psychological tools.											
Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:												
	PO1	PO2	PO3	PO 4	PO 5	PO 6	PO 7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	0	1	1	0	3	0	3	1	2	3	2
CO2	2	1	1	1	1	3	2	0	2	3	0	1
CO3	1	1	2	1	1	3	3	0	1	1	2	2
CO4	1	1	2	2	1	3	3	0	0	3	2	3
CO5	0	0	0	0	0	0	0	0	0	0	0	0
Average	1.75	0.75	1.5	1.25	0.75	3	2	0.75	1	2.25	1.75	2



<b>Name of the Department</b>		Psychology										
<b>Name of the Program</b>		B.Sc. (Hons. With Research) Psychology										
<b>Unique Code</b>		0270321061										
<b>Course Title</b>		<b>Abnormal Psychology</b>										
<b>Academic Year</b>		2024-2025										
<b>Semester</b>		II										
<b>Number of Credits</b>		4										
<b>Course Prerequisite</b>												
<b>Course Synopsis</b>		This course will provide an overview of the scientific study of mental illness (also known as psychopathology). The course will cover basic concepts and definitions, historical perspectives on abnormal behaviour, different theoretical models, the assessment and diagnosis of mental illness. The course also focus on the leading categories of mental disorders among adults, children and adolescents, including the description and classification of these disorders and some of the treatments for these disorders.										
<b>Course Outcomes:</b>												
At the end of the course students will be able to:												
<b>CO1</b>	Understand the definition and criteria of abnormal behaviour, incorporating historical perspectives and contemporary views to analyse the evolution of thought on abnormal psychology.											
<b>CO2</b>	Develop the sensitivity towards individual diversity and various approaches to the diagnosis and treatment of psychological disorders.											
<b>CO3</b>	Enhance personal and social interactions by using the knowledge of the history and major theories of abnormal behavior.											
<b>CO4</b>	Understand criteria of abnormality and one’s own behavior and behavior of others.											
<b>CO5</b>	Demonstrate the application of theoretical insights acquired during the course through active participation in practical sessions, allowing for the practical application of concepts covered in the units.											
<b>Mapping of Course Outcomes (COs) to Program Outcomes (POs)&amp; Program Specific Outcomes:</b>												
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PSO1	PSO2	PSO3	PSO4	PSO5
CO1	3	1	1	1	2	2	3	2	0	0	2	2
CO2	3	1	3	3	1	2	3	1	0	1	3	3
CO3	3	0	3	2	3	3	2	1	0	2	2	3
CO4	2	0	2	2	1	3	1	0	1	1	1	2
<b>Average</b>	<b>2.75</b>	<b>0.5</b>	<b>2.25</b>	<b>2</b>	<b>1.75</b>	<b>2.5</b>	<b>2.25</b>	<b>1</b>	<b>0.25</b>	<b>0.75</b>	<b>2</b>	<b>2.5</b>



**2. PROGRAM EDUCATION OBJECTIVES (PEOs)**

After completing B.A. (Hons. with Research) Liberal Arts, students will be able to:

PEO No.	Education Objective
PEO1	Graduates of the program will be able to critically evaluate complex issues, arguments, and information from multiple perspectives, demonstrating the ability to think analytically and make informed judgments.
PEO2	Graduates will possess strong written, oral, and visual communication skills, enabling them to articulate their ideas clearly and persuasively to diverse audiences in academic, professional, and civic contexts.
PEO3	Graduates will have a broad understanding of the interconnectedness of knowledge across disciplines within the Liberal Arts, recognizing the value of integrating insights from different fields to address complex problems and explore diverse perspectives.
PEO4	Graduates will demonstrate an appreciation for cultural diversity and global interconnectedness, understanding the historical, social, and cultural contexts that shape human experiences and societies around the world.
PEO 5	Graduates will exhibit ethical awareness and a commitment to social justice, demonstrating the ability to engage responsibly and ethically in their communities and contribute positively to societal well-being.

### 3. GRADUATE ATTRIBUTES

Sl. No.	Attributes	Description
1	Professional /Disciplinary Knowledge	Capable of demonstrating comprehensive knowledge and understanding of one or more disciplines like Language, Literature, Economics, Political Science and Psychology as part of Liberal arts undergraduate program.
2	Practical skills	Empowers graduates with transferable research and analytical skills. These skills include data analysis, research design, and critical thinking, preparing them to tackle complex problems across diverse careers in Economics, Political Science and Social Sciences.
3	Communication Skill	Ability to develop adaptable communication skills. They can tailor their message (written, oral, or visual) to effectively engage diverse audiences, whether presenting research findings to academics, crafting policy briefs for government officials, or explaining complex social science concepts to the public.
4	Cooperation/Team work	Ability to work effectively and respectfully with diverse teams; facilitate cooperative or coordinated effort on the part of a group, and act together as a group or a team in the interests of a common cause and work efficiently as a member of a team like in the field of conflict resolution, consulting and decision making.
5	Professional ethics	Ability to develop a strong ethical compass. They gain awareness of ethical dilemmas in the liberal arts fields and a commitment to responsible conduct throughout their careers.
6	Research / Innovation-related Skills	Ability to analyze interpret and draw conclusions from quantitative/qualitative data; and critically evaluate ideas, evidence and experiences from an open-minded and reasoned perspective.
7	Critical thinking and problem solving	Capability to apply analytic thought to liberal arts fields; analyse and evaluate evidence, arguments, claims, beliefs on the basis of empirical evidence; identify relevant assumptions or implications; formulate coherent arguments; critically evaluate practices, policies and theories by following scientific approach to knowledge development.
8	Reflective thinking	Critical sensibility to lived experiences, with self-awareness and reflexivity of both self and society.
9	Information/digital literacy	Capability to use ICT in a variety of learning situations, demonstrate ability to access, evaluate, and use a variety of relevant information sources; and use appropriate software for analysis of data for understating



		issues in social domain.
10	Multi-cultural competence	Possess knowledge of the values and beliefs of multiple cultures and a global perspective; and capability to effectively engage in a multicultural society and interact respectfully with diverse groups.
11	Leadership readiness/qualities	Capability for mapping out the tasks of a team or an organization, and setting direction, formulating an inspiring vision, building a team who can help achieve the vision, motivating and inspiring team members to engage with that vision, and using management skills to guide people to the right destination, in a smooth and efficient way.
12	Lifelong learning	Ability to acquire knowledge and skills, including 'learning how to learn', that are necessary for participating in learning activities throughout life, through self-paced and self-directed learning aimed at personal development, meeting economic, social and cultural objectives, and adapting to changing trades and demands of work place through knowledge/skill development/re-skilling.

## 5. PROGRAM OUTCOMES

PO No.	Attribute	Competency
PO1	Professional knowledge	Graduates will demonstrate a deep understanding of key concepts, theories, and practices relevant to their chosen field(s) of interest within the Liberal Arts, such as Literature, History, Economics, Philosophy, Social Sciences, Natural Sciences, or the Arts.
PO2	Ethical value & Professionalism	Graduates will exhibit ethical awareness and professional integrity in their interactions with colleagues, clients, and stakeholders, adhering to ethical standards and best practices relevant to their chosen field(s) of study and professional endeavors.
PO3	Communication	Graduates will demonstrate creativity and innovation in their communication skills and will develop an enhanced approach to problem-solving and expression, generating novel ideas, solutions, and interpretations that challenge conventional thinking and expand intellectual horizons.
PO4	Evidence Based Practice/Learning	Graduates will demonstrate proficiency in research methods and scholarly inquiry, conducting independent research projects, evaluating academic sources, and contributing original insights to their chosen field of study.
PO5	Entrepreneurship, Leadership and Mentorship	Graduates will engage as responsible citizens and leaders in their communities, demonstrating a commitment to an encouraging pathway to honing their entrepreneurship skills, they will contribute to social justice, equity, and the common good through civic engagement, advocacy, and service.

## 6. PROGRAM SPECIFIC OUTCOMES

PSO No.	Competency
PSO1	Graduates will demonstrate the ability to integrate insights from multiple disciplines within the Liberal Arts, synthesizing knowledge from fields such as Literature, Economics, History, Philosophy, Social Sciences, Natural Sciences, and the arts to address complex problems and explore connections between different areas of study.
PSO2	Graduates will exhibit cultural competence and global awareness, understanding the cultural diversity of human societies and appreciating the interconnectedness of local, national, and global perspectives through the study of Literature, Economics, History, Languages, and cross-cultural interactions.
PSO3	Graduates will demonstrate creativity and innovation in their approach to problem-solving, expression, and inquiry, generating original ideas, interpretations, and solutions that challenge conventional thinking and contribute to intellectual and cultural discourse.
PSO4	Graduates will be prepared to pursue further study at the graduate level or to enter a variety of career paths, including but not limited to academia, education, publishing, media and communications, cultural institutions, public service, non-profit organizations, and the creative industries, equipped with the knowledge, skills, and values needed to succeed in diverse professional and academic contexts.

Akai College of Arts and Social Sciences	
<b>Name of the Department</b>	History
<b>Name of the Program</b>	B.A. (Hons. with Research) Liberal Arts
<b>Course Code</b>	0240111010
<b>Course Title</b>	<b>INTRODUCTION TO ANCIENT INDIAN HISTORY-I</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	Learners are expected to have a curiosity or interest for History.
<b>Course Synopsis</b>	Introduction to Ancient Indian History-I, course is designed to provide students with a foundational understanding of the early history of the subcontinent. Through this course students will understand the pre-historic cultures, Vedic and later Vedic societies, emergence of different empires during mauryan and post-mauryan period.

**Course Outcomes:**

At the end of the course students will be able to:

<b>CO1</b>	The students learn the meaning of and scope of history as a discipline. It will help them to understand the social, economic and political structure of Harappa civilization.
<b>CO2</b>	The student will utilize analytical skills to evaluate the impact of Vedic and Post-Vedic societies on Ancient Indian culture and civilization.
<b>CO3</b>	The students will be able to examine the political and administrative system of Mauryan Empire under Chandragupta Maurya and Ashoka.
<b>CO4</b>	Students will access the key characteristics of Post Mauryan Empire and socio-economic development during Sangam Age, determine their significance in Ancient Indian History.

**Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium**

<b>COS</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>
<b>CO1</b>	3	1	1	2	3	3	3	1	2

<b>CO2</b>	3	2	1	1	1	2	2	1	2
<b>CO3</b>	2	1	1	2	2	2	1	1	2
<b>CO4</b>	3	1	1	3	2	2	2	1	1



Akai College of Arts and Social Sciences									
Name of the Department		History							
Name of the Program		B.A. (Hons. with Research) Liberal Arts							
Course Code		0240111020							
Course Title		MEDIEVAL INDIAN HISTORY: DELHI SULTANATE 1206-1526 A.D.							
Academic Year		2024-25							
Semester		I							
Number of Credits		4							
Course Prerequisite									
Course Synopsis		This course offer a comprehensive exploration of Delhi Sultanate and its expansion and fall, covering key dynasties, rulers, administrative policies, societal structures and cultural developments from thirteenth to sixteenth century in the Indian subcontinent.							
Course Outcomes:									
At the end of the course students will be able to:									
CO1	The course equips the students with comprehensive understanding of the foundation, consolidation, expansion an eventual decline of Delhi Sultanate.								
CO2	The students will be able to critically analyze the problems, policies, and reforms of the rulers of Delhi Sultanate and accessing their impact on governance, economy and society during medieval period in India.								
CO3	The students will evaluate the socio-economic conditions prevalent during the sultanate period including agriculture practices, industrial development, trade networks and their implications for urbanization and societal stratification.								
CO4	The students will access the cultural contribution of Delhi sultanate and apply their historical knowledge to analyze maps illustrating the territorial extent of Delhi Sultanate.								
Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium									
Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	1	1	1	2	2	2	1	2
CO2	3	1	1	1	1	2	2	1	2
CO3	2	1	1	1	1	2	2	1	2
CO4	2	1	1	2	1	2	2	1	2

Akal College of Arts and Social Sciences	
<b>Name of the Department</b>	History
<b>Name of the Program</b>	B.A. (Hons. with Research) Liberal Arts
<b>Course Code</b>	0240111010
<b>Course Title</b>	<b>INTRODUCTION TO ANCIENT INDIAN HISTORY-I</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	Learners are expected to have a curiosity or interest for History.
<b>Course Synopsis</b>	Introduction to Ancient Indian History-I, course is designed to provide students with a foundational understanding of the early history of the subcontinent. Through this course students will understand the pre-historic cultures, Vedic and later Vedic societies, emergence of different empires during Mauryan and Post-Mauryan period.

**Course Outcomes:**

At the end of the course students will be able to:

<b>CO1</b>	The students learn the meaning of and scope of history as a discipline. It will help them to understand the social, economic and political structure of Harappa civilization.
<b>CO2</b>	The student will utilize analytical skills to evaluate the impact of Vedic and Post-Vedic societies on Ancient Indian culture and civilization.
<b>CO3</b>	The students will be able to examine the political and administrative system of Mauryan Empire under Chandragupta Maurya and Ashoka.
<b>CO4</b>	Students will access the key characteristics of Post Mauryan Empire and socio-economic development during Sangam Age, determine their significance in Ancient Indian History.

**Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium**

<b>COS</b>	<b>PO 1</b>	<b>PO 2</b>	<b>PO 3</b>	<b>PO 4</b>	<b>PO 5</b>	<b>PSO 1</b>	<b>PSO 2</b>	<b>PSO 3</b>	<b>PSO 4</b>
<b>CO1</b>	3	1	1	2	3	3	3	1	3

<b>CO2</b>	3	2	1	1	1	2	2	1	1
<b>CO3</b>	2	1	1	2	2	2	1	1	2
<b>CO4</b>	3	1	1	3	2	2	2	1	2



Akal College of Arts and Social Sciences									
Name of the Department		History							
Name of the Program		B.A. (Hons. with Research) Liberal Arts							
Course Code		0240121030							
Course Title		HISTORY OF INDIA: C.300-1206 A.D.							
Academic Year		2024-25							
Semester		II							
Number of Credits		4							
Course Prerequisite									
Course Synopsis		This course provides a comprehensive view of Gupta empire, post-Gupta period and early medieval age in India. It explores the political, social, economic and cultural developments during these periods; it also includes rise and decline of empires, administrative structures, societal dynamics and social trends.							
Course Outcomes:									
At the end of the course students will be able to:									
CO1	The students will be able to achieve a deep grasp of Indian history, particularly the Gupta empire and subsequent period, encompassing their political, social and cultural intricacies.								
CO2	By studying the course, the students will be able to critically evaluate the political and administrative framework of various dynasties, discerning their strength, weakness and impact on governance.								
CO3	The students will access the societal and cultural change that occurred during the period, including shift in religious trends, literary achievements, and artistic expression and understanding their significance in shaping Indian society.								
CO4	Students will gain knowledge of territorial extent of significant empires and kingdoms and the implication of their expansion and decline on their broader historical landscape.								
Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium									
Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	1	2	1	2	3	3	2	2
CO2	2	1	2	1	2	3	1	2	2
CO3	3	2	2	1	2	3	2	1	2
CO4	2	1	1	1	2	2	2	1	2

Akai College of Arts Social Sciences	
<b>Name of the Department</b>	History
<b>Name of the Program</b>	B.A. (Hons. with Research) Liberal Arts
<b>Course Code</b>	0240121040
<b>Course Title</b>	<b>HISTORY AND HISTORIOGRAPHY</b>
<b>Academic Year</b>	2024-25
<b>Semester</b>	II
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	
<b>Course Synopsis</b>	<p>This course provides comprehensive overview of history. Exploring its definition, purpose, scope and value. It delves into history both as literature and science examining its relationship with other disciplines. Additionally the course explores the historiography, focusing key figures and traditions in Greek, Roman, Christian, Arab, Indian and modern Historiography. It also covered the historical method, including the categorization, authenticity and reliability of evidence as well as the concept of causation, objectivity and generalization. Finally the course examines various approaches to history.</p>
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The student will develop a comprehensive understanding of nature and significance of history as a discipline, including its definition, purpose and interdisciplinary connection.
<b>CO2</b>	Students will analyzed and evaluate key figures and traditions in historiography, ranging from ancient Greek and Roman Historians to modern approaches.
<b>CO3</b>	Students will apply the historical methods effectively, including the categorization, assessment and interpretation of historical evidence by

	considering concepts such as causation, objectivity and generalization.								
CO4	Students will cultivate the ability to critically access and compare different approaches to history, including Orientalist, Imperialist, Nationalist, Marxist, Subaltern and Post-Modernist prospective, enabling a nuanced understanding historical interpretation and representation.								
Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium									
Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	1	1	2	1	2	3	3	2
CO2	2	1	1	2	1	1	3	2	2
CO3	2	1	2	3	1	1	1	2	1
CO4	2	1	2	3	1	1	2	1	1



Akai College of Arts and Social Sciences									
Name of the Department		History							
Name of the Program		B.A.(Hons. with Research) Liberal Arts							
Course Code		0240121030							
Course Title		HISTORY OF INDIA c. 300-1206 A.D.							
Academic Year		2024-25							
Semester		II							
Number of Credits		4							
Course Prerequisite									
Course Synopsis		This course provides a comprehensive view of Gupta empire, post-Gupta period and early medieval age in India. It explores the political, social, economic and cultural developments during these periods; it also includes rise and decline of empires, administrative structures, societal dynamics and social trends.							
Course Outcomes:									
At the end of the course students will be able to:									
CO1	The students will be able to achieve a deep grasp of Indian history, particularly the Gupta empire and subsequent period, encompassing their political, social and cultural intricacies.								
CO2	By studying the course, the students will be able to critically evaluate the political and administrative framework of various dynasties, discerning their strength, weakness and impact on governance.								
CO3	The students will access the societal and cultural change that occurred during the period, including shift in religious trends, literary achievements, and artistic expression and understanding their significance in shaping Indian society.								
CO4	Students will gain knowledge of territorial extent of significant empires and kingdoms and the implication of their expansion and decline on their broader historical landscape.								
Mapping of Course Outcomes (COs) to Program Outcomes (POs) S=strong, W=weak, M=medium									
Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PSO 1	PSO 2	PSO 3	PSO 4
CO1	3	1	2	1	2	3	3	2	2
CO2	2	1	2	1	2	3	1	2	2
CO3	3	2	2	1	2	3	2	2	2
CO4	2	1	1	1	2	2	1	1	2

## 2. PROGRAM EDUCATION OBJECTIVES (PEOs)

The learning objective of B.A. (Hons. with Research) Music Program are:

PEO No.	Education Objective
PEO1	To develop a thorough understanding of basic concepts, historical studies (Ancient, Medieval and Modern) and application of various techniques of singing/ playing in Music.
PEO2	To develop performing skills of various components such as- Khayal, Dhrupad, Dhamar, Bandish/ Gat , Tarana, Alaap , Taan, Jod, Jhala, etc. in Hindustani Music( Vocal/ Instrumental) right from basic to advance level.
PEO3	To enhance performance skills in Gurmat Sangeet( Vocal/ Instrumental) through proper training of various components such as- Shabad in Raag, Shabad in Reet style, Manglacharan, Partaal, etc.
PEO4	To develop performance skills of Dhadhi Vaaran style of singing Folk music (Veer Ras) depicting sikh culture. And to develop performance skills of Tabla for better understanding of Laya and Taala.
PEO5	To gain experience through internships and live performances on various occasions in different schools, colleges and other organizations.

## 3. GRADUATE ATTRIBUTES

Sl. No.	Attributes	Description
1	Theoretical Knowledge	Graduates will possess a comprehensive understanding of core concepts within the field of Indian classical music and Gurmat Sangeet.
2	Practical skills related to Indian Classical music	Graduates will be proficient in various styles of Indian Classical music such as- Khayal, Dhrupad, Dhamar, Tarana, Folk music, Bhajan, Shabad, Gat ( Instrumental music), Jhala, Dhun etc.
3	Practical skills related to Gurmat Sangeet and Dhadhi Vaaran	Graduates will be proficient in various styles of Dhadhi Vaaran and Gurmat Sangeet such as- Manglacharan, Partaal, Asa ki Vaar, Anand Sahib, Laavan, Shabad in Raag and Shabad in Reet Style.
4	Practical skills related to Percussion skills	Graduates will learn Different taalās of Indian classical music through playing Tabla as well as through hand beats contributing to the skills of Sangat with Hindustani Sangeet and Gurmat Sangeet.
5	Solo and Group Performance Skills	Graduates will be trained as a solo performer as well as group performer. They will learn to sing/ Play as a solo performer while performing classical music and they will also learn to perform in a group while reciting Shabad and Dhadhi Vaaran.
6	Research / Innovation-related Skills	Graduates will possess strong research and innovation skills, including the ability to design and execute research projects, critically evaluate existing literature and contribute to the advancement of knowledge in the field of music.

## 5. PROGRAM OUTCOMES

PO No.	Attribute	Competency
PO1	Professional knowledge	To be able to develop performing skills for practical presentation of Hindustani Sangeet and Gurmat Sangeet tradition.
PO2	Theoretical Knowledge	To be able to develop knowledge of various theoretical concepts of Hindustani Sangeet and Gurmat Sangeet tradition.
PO3	Scope for Higher Education	The program also broadens the scope of higher education by providing an overall knowledge in Hindustani Sangeet and Gurmat Sangeet as well as choices like Hindustani Music Vocal/Instrumental/ Percussion.
PO4	Employment and Entrepreneurship	To be able to secure employment as Music Teacher at PRT & TGT level in the discipline and to be able to work as Tutor of Hindustani Music and Gurmat Sangeet and also can develop entrepreneurship by establishing self- owned institute.
PO5	Performing Skills	To be able to develop performing skills enhancing career opportunities through social media like YouTube, various Podcasts as well as Live Stage Performances (Vocal/ Instrumental).



## 6. PROGRAM SPECIFIC OUTCOMES

PSO No.	Competency
PSO1	Students will be able to perform the various practical aspects of the discipline viz. Various Gayan/Vaadan Shaillies (Khayal, Dhrupad, Dhamar, Tarana, Gat, Jod- Jhala, etc.), Ragas of Hindustani Sangeet as well as Traditional compositions along with light tunes.
PSO2	Being aware of the in depth knowledge of theoretical aspects of the discipline such as- History of Indian music, Life and Contribution of various musicians, History of Instruments, Classification of Instruments, Time theory, Theoretical aspect of Raagas, Notation of Compositions, etc.
PSO3	Being able to learn the skill of self -composition developing the creative and aesthetical view of music, knowledge of different scales on Harmonium and being able to perform compositions in various taalas.
PSO4	Student will have an exposure to Gurmat Sangeet Shaillies such as- Manglacharan, Partaal, Laavan, Raag Gayan, Reet Gayan, Asa ki Vaar, Anand Sahib, etc.
PSO5	The student will be able to develop skill of presentation of Dhadi Vaaran (Dhadh, Dhadhi Vaaran Sarangi, Maracas, Commentary and Poems of Veer Ras) and playing Tabla.
PSO6	To acquire proficiency in research design and methodology, including the ability to formulate research questions, design appropriate studies, select and implement research methods, and analyze and interpret data using statistical techniques through research projects in semester 7 and 8.

## SEMESTER – I

Course Code	Course Type	Course Title
0250211010	DSC-1	Introduction to Indian Music -1
0250211021	DSC-2	Stage Performance - 1
0250211031	DSC-3	Tabla & Dhadhi Vaaran- 1

<b>Name of the Department</b>	Department of Music
<b>Name of the Program</b>	B.A. (Hons. with Research) Music
<b>Course Code</b>	<b>0250211010</b>
<b>Course Title</b>	<b>Introduction to Indian Music -I</b>
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	The student should have aptitude in learning basic concepts of Indian music
<b>Course Synopsis</b>	This course introduces a beginner into the Universe of Indian Classical Music where the student is made aware of the rich cultural heritage of our country. The course is designed to bridge the foundation in the Theoretical knowledge of students learning Hindustani Sangeet enabling the students to pursue the field professionally. The students will learn about the basic concepts of Hindustani Music and Gurmat Sangeet. They will learn about the Notation System for better understanding of the written format of the compositions. The course also provides detailed knowledge about the description of the Instrument chosen by the student.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The students will be aware of the basic terminologies of Indian music, which will help them to properly understand not only Indian classical music but Gurmat Sangeet as well. These terminologies such as Swar, Saptak, Shruti, Thaata, Raaga, Alaap, Rahao, Anka, Ghar Asa ki Vaar etc. will help them in pursuing their career as a musicologist.
<b>CO2</b>	The students will be able to develop skillset to read and write notation system which will help them to learn new compositions of different styles and genres.

CO3	The students will learn the theoretical concepts of the Indian Raagas which will help them in understanding the basic grammatical rules of a raaga.										
CO4	The students will be aware of the taala system and various taalas used in Indian classical music. They will also learn to write Taalas with notation.										
Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:											
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	2	2	1	1	3	1	-	-	-
CO2	1	2	-	-	-	-	2	1	-	-	-
CO3	2	2	2	3	2	2	3	3	2	1	2
CO4	2	2	2	2	2	2	1	2	1	3	1
1= Weak Correlation			2= Moderate Correlation				3= Strong Correlation				

<b>Name of the Department</b>	Department of Music
<b>Name of the Program</b>	B.A. (Hons. with Research) Music
<b>Course Code</b>	0250211021
<b>Course Title</b>	Stage Performance - 1
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	The student should have aptitude in learning Indian music practically
<b>Course Synopsis</b>	This course introduces a beginner into the universe of Indian Classical Music where the student is made aware of the rich cultural heritage of our country. The course is designed to bridge the foundation in the Practical knowledge of students learning Hindustani Sangeet enabling the students to pursue the field professionally. The students will learn about the basic techniques of Hindustani Music. They will learn about the systematic performance in Vocal/ Instrumental music whichever stream is chosen by them. They will also learn light music composition like Shabad, Bhajan, Dhun, etc. Most importantly they will learn to play or sing with the sangat of Tabla.
<b>Course Outcomes:</b>	
At the end of the course students will be able to:	
<b>CO1</b>	The students will become well verse with the techniques of singing and playing as per their chosen discipline.
<b>CO2</b>	Having said the students will learn the notation system, they will be able to learn and understand the compositions.
<b>CO3</b>	The students will learn the systematic progress of a Raaga in Vocal or Instrumental field as per the chosen discipline.
<b>CO4</b>	They will be aware of the basic grammatical rules of the Raaga such as Notes of the Raaga, Time of the Raaga, Vadi- Samvadi, Jati, Ascending and Descending of the Raaga etc.
<b>CO5</b>	They will learn Light music compositions and they will also learn to sing or play with the sangat of Tabla.

**Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:**

	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	3	2	3	3	3	3	1	3	1	1	1
CO2	1	2	1	1	1	2	1	-	-	-	-
CO3	3	1	3	3	3	3	1	3	-	1	3
CO4	2	2	2	2	2	2	2	2	1	2	2
CO5	3	1	1	3	3	3	1	3	2	2	2

1= Weak Correlation

2= Moderate Correlation

3= Strong Correlation



<b>Name of the Department</b>	Department of Music
<b>Name of the Program</b>	B.A. (Hons.) Music with Research
<b>Course Code</b>	0250211031
<b>Course Title</b>	Tabla and Dhadhi Vaaran- 1
<b>Academic Year</b>	I
<b>Semester</b>	I
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	The student should have aptitude in learning Tabla and Dhadhi vaaran
<b>Course Synopsis</b>	This course introduces a beginner into the field of Tabla and Dhadhi Vaaran where the student will learn the basics of Tabla and Dhadhi Vaaran practically. They will learn about the Varnas on Tabla and will also learn to play Theka of Teen Taala and Kaharawa Taala. The course also provides practical knowledge of Dhadhi Kala right from the beginning. They will also learn about the Origin, History, and Parts of Dhadhi Kala. They will also learn to present Prasangs along with Dhadh, Dhadhi Vaaran Sarangi and Commentary as per the chosen instrument or commentary.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The student will be aware of the basic terminologies of Tabla and Dhadhi Kala such as- Laya (Tempo), Taala (Rhythmic Cycle), Matra, Theka, Bol, Prasang, Dhadi Kala etc.
<b>CO2</b>	The student will be able to play the Varnas on Tabla such as Dha, Ta, Tin, Dhin, Te, Tu, Re, Ghe etc.
<b>CO3</b>	The student will learn about Origin, History and Parts of Dhadi Kala They will also learn to present Dhadhi Vaaran in Solo and Group Performance.
<b>CO4</b>	The student will learn to play Thah and Dugun of Teen Taala and Kahrawa Taala on Tabla as well as on Hand beats.
<b>CO5</b>	They will learn to play Dhadh and Dhadhi Vaaran Sarangi to accompany with Dhadhi Vaaran. They will also learn commentary. The student will have to prepare instrument or commentary according to their choice.

Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:											
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	2	2	2	-	1	3	1	-	3	3
CO2	1	1	2	2	3	3	-	3	-	-	-
CO3	-	2	-	-	3	-	-	1	-	3	3
CO4	-	-	2	2	3	3	-	3	-	-	-
CO5	-	-	-	-	3	-	-	1	-	3	-
1= Weak Correlation			2= Moderate Correlation			3=Strong Correlation					

<b>Name of the Department</b>	Department of Music
<b>Name of the Program</b>	B.A. (Hons. with Research) Music
<b>Course Code</b>	0250221040
<b>Course Title</b>	<b>Introduction to Indian Music (Part-2)</b>
<b>Academic Year</b>	I
<b>Semester</b>	II
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	The student should have aptitude in learning comparative concepts of Indian music
<b>Course Synopsis</b>	This course is designed to give knowledge to the students about various comparative concepts of Indian music. The course also provides knowledge about various concepts of Gurmat Sangeet. The students will also learn about contribution of various musicians. They will learn about Classification, Origin and development of the instruments. They will also learn about various raagas and taalas.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The students will gain knowledge about comparative study between various concepts of Indian music such as- Raaga and that; Bandish and Gat; Taan and Toda; Alaap and Taan etc.
<b>CO2</b>	The student will develop understanding about important concepts of Gurmat Sangeet such as- Comparative study of Indian Classical music and Gurmat Sangeet; Importance of Instruments in Gurmat Sangeet; Sri Guru Granth Sahib Ji ( in context with music).

CO3	Students will study about Origin and development of Instruments; Classification of Instruments; Biographies of various musicians.										
CO4	The students will learn to write and understand various Taalas such as- Rupak Taala, Ek Taala, etc. They will also learn about various raagas such as- Bhupali, Bhimplasi and Vrindavani Sarang										
Mapping of Course Outcomes (COs) to Program Outcomes (POs)& Program Specific Outcomes:											
	PO1	PO2	PO3	PO4	PO5	PSO1	PSO2	PSO3	PSO4	PSO5	PSO6
CO1	1	3	2	2	-	1	3	-	-	-	2
CO2	2	3	1	2	1	1	1	-	2	-	1
CO3	2	3	2	1	-	-	3	1	-	-	2
CO4	3	1	2	3	3	3	1	2	1	-	2
1= Weak Correlation			2= Moderate Correlation			3=Strong Correlation					





<b>Name of the Department</b>	Department of Music
<b>Name of the Program</b>	B.A. (Hons. with Research) Music
<b>Course Code</b>	0250221061
<b>Course Title</b>	Tabla and Dhadhi Vaaran- 2
<b>Academic Year</b>	I
<b>Semester</b>	II
<b>Number of Credits</b>	4
<b>Course Prerequisite</b>	The student should have aptitude in learning different layakaries of Taalas and different Prasangs in Dhadhi Vaaran
<b>Course Synopsis</b>	This course provides practical knowledge of Tabla and Dhadhi Vaaran to the students. The student will learn different layakaries of Teen Taala, Dadra Taala, Rupak Taala and Kahrawa Taala. They will also learn Prakaars of different taalas. The student will learn different Prasangs related with Guru Nanak Dev Ji. They will also learn to play Kahrawa Taala on Dhadh. They will learn Saaka, Rasalu and Raag Pahadi on Dhadi Vaaranh Sarangi. Most importantly they will gain knowledge about the history beyond the Prasangs.
<b>Course Outcomes:</b> At the end of the course students will be able to:	
<b>CO1</b>	The student will learn terminologies of Tabla such as- Kisam, Prakaar, Tihai, etc.
<b>CO2</b>	The students will learn to play Thah and Dugun layakaries of Teen Taala, Dadra Taala, Rupak Taala and Kahrawa Taala.
<b>CO3</b>	The students will learn about Origin and History of Tabla
<b>CO4</b>	The students will learn to perform two Prasangs relating Guru Nanak Dev Ji and Massa Rangar
<b>CO5</b>	They will learn to play Saaka, Rasalu and Raag Pahadi on Dhadhi Vaaran Sarangi
<b>CO6</b>	They will learn to play Kahrawa Taal on Dhadh

## B.A. (Hons.) Gurmat Sangeet

### PROGRAMME OUTCOMES , PROGRAMME SPECIFIC OUTCOMES, COURSE OUTCOMES

<b>B.A (Hons)) Music- Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. To be able to develop performing skills for practical presentation of Gurmat Sangeet tradition.</li> <li>2. To be able to secure employment as Music teacher at PGT &amp; TGT level in the discipline.</li> <li>3. To be able to work as Tutor of Kirtan and also can develop entrepreneurship by establishing self owned institute.</li> <li>4. The student will be able to develop performing skills thereby enhancing career opportunities through social media like You tube, Facebook &amp; Instagram etc.</li> </ol>
<b>Programme Specific Outcome</b>	<ol style="list-style-type: none"> <li>1. Students will be able to Perform the various practical aspects like Gayan shellies, folk styles and light composition of Gurmat Sangeet Tradiition.</li> <li>2. Being able to perform in Various taals.</li> <li>3. Being aware of the in depth knowledge of theoretical aspects of the discipline.</li> <li>4. being able to learn the skill of self-composition and develop creativity in the discipline as per the present day requirements.</li> <li>5. being able to develop fluency in playing music instrument.</li> </ol>
<b>Course: B.A (Hons.) Music</b>	<b>Outcomes</b>
<b>Semester – 1</b>	
<b>Gurmat Sangeet (Major) (Theory) -1 (MGS-101)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of technical terminology of the discipline.</li> </ol>

	<p>2. Acquire the knowledge of origin and development of Gurmat sangeet.</p> <p>3. Enable students to write and read music from the traditional notation system.</p>
<b>Gurmat Sangeet (Major) (Practical) - 1 (MGS-102)</b>	<p>1. The student will be able to achieve dexterity of the voice.</p> <p>2. Student will be able to learnt the grammatical and practical aspects of prescribed ragas in taals.</p> <p>3. Student will be able to perform the kirtan of Asa di waar with use of different taals and tunes.</p> <p>4. Student will be able to develop playing technique of Harmonium with proficiency.</p>
<b>Tabla (Minor-1) MTB - 103</b>	<p>1. Knowledge of varn of tabla.</p> <p>2. Define the music term, Theka, Taal, Taali, Khaali, Vibhag.</p> <p>3. Knowledge of origin of Tabla.</p> <p>4. Teentaal, KahravataalThah and Dugun.</p> <p>5. Dadra, Rupak Theka Prakaar.</p> <p>Knowledge of Bhatkhande Taal Notation system</p>
<b>Compulsory English Eng -101</b>	<p>1. To Understand the correct application of the subject.</p> <p>2. To enrich their vocabulary</p> <p>3. To Develop beginning vocabulary and aesthetic sense both</p> <p>4. Learn to make coherent sentences and propound coherent ideas</p> <p>5. Close Reading and critical analysis of the Text</p>
<b>Lazmi Punjabi Pbi- 114</b>	<p>1. ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਭਾਈ ਵੀਰ ਸਿੰਘ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਕ, ਪੂਰਨ ਸਿੰਘ, ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਫੀਰ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਹਰਿਭਜਨ ਸਿੰਘ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>2. ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸਤਾਈ ਜਨਵਰੀ, ਮੁੜ ਵਿਧਵਾ, ਪਠਾਣ ਦੀ ਧੀ, ਤ੍ਰਿਸ਼ਨਾ, ਭੇਤ ਵਾਲੀ ਗੱਲ, ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ, ਇਕ ਬਾਲੜੀ ਦੇ ਪਤਾਸੇ, ਮੋਹੜੀ) ਦੇ ਸੰਦਰਭ</p>

	<p>3. ਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ, ਉਪਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ-ਸੰਬੰਧ, ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਈ ਵੰਨਗੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>4. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ-ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ, ਵਿਸਮਿਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<b>Semester - 2</b>	
<b>Gurmat Sangeet (Major) (Theory) -2 (MGS-121)</b>	<p>1. Acquire the knowledge of technical terminology of Gurmat sangeet.</p> <p>2. Acquire the knowledge of ancient concepts of music viz Nibadh and Anibadh gaan and Alaaps – Taans.</p> <p>3. Acquire the Detailed knowledge shri guru granth sahib ji.</p> <p>4. Being aware of contribution of shri guru nanak dev ji</p> <p>5. Being Aware of the description and identification of ragas from given swar patterns.</p>
<b>Gurmat Sangeet (Major) (Practical) -2 (MGS-122)</b>	<p>1. Student will be able to learn the grammatical and practical aspects of prescribed ragas in taals.</p> <p>2. Student will be able to sing Manglacharan in Vilambit laya.</p> <p>3. Student will be able to play shaan on Harmonium with proficiency.</p> <p>4. Student will be able to learn light shabad reets in different taals.</p> <p>5. Students will be able to learn poem on martyrdom of Chote Sahibzade and on Sikh itihaas.</p>

<b>Tabla (Minor -2) MTB -123</b>	<ol style="list-style-type: none"> <li>1. Define the following musical terms, Avartan, Matra, Mohra, Tihailaya.</li> <li>2. Ability to demonstrate different layaKaries in Dadra, KeherwaRupak and TeentaalThah and Dugun with description.</li> <li>3. Ability to play following taals on with the prakars in each: Dadra, Keherwa, Roopak and Teental (different from previous semester)</li> <li>4. Ability to play one Tihai and Mohra each in the above mentioned Taals</li> <li>5. Proficiency in Taal – Pehchan.</li> <li>6. Viva</li> </ol>
<b>Compulsory English Eng -121</b>	<ol style="list-style-type: none"> <li>1. To enhance the critical thinking of the students with the help of poetry and essays.</li> <li>2. To read and appreciate the beauty of stories on their own.</li> <li>3. To teach them the intricacies of grammar so that they can make sentences on their own without any grammatical errors.</li> <li>4. Enable them to understand the difference between formal and informal communication with the help of letter writing.</li> <li>5. To enlighten and aware students about the literary characteristics of various poetic forms.</li> </ol>
<b>Lazmi Punjabi Pbi- 124</b>	<ol style="list-style-type: none"> <li>1. ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸ.ਸ. ਮੀਸ਼ਾ, ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ, ਰਵਿੰਦਰ ਰਵੀ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼, ਹਰਿਭਜਨ ਹਲਵਾਰਵੀ, ਮਨਜੀਤ ਟਿਵਾਣਾ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>2. ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸ਼ਹੀਦ, ਜਿਊਣ ਜੇਗੇ, ਮੂਨ ਦੀ ਅੱਖ, ਇੱਕੀਵੀਂ ਸਦੀ, ਬਠਲੂ ਚਮਿਆਰ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ, ਡੂੰਮ) ਦੇ ਸੰਦਰਭ ਵਿਚ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>3. ਗੁਰਮੁਖੀ ਲਿਪੀ: ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸੰਬੰਧ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> </ol>

	<p>4. ਵਿਆਕਰਨਿਕ ਸ਼੍ਰੇਣੀਆਂ: ਲੋੜ, ਮਹੱਤਵ ਅਤੇ ਮੁੱਖ ਸੰਕਲਪ - ਵਚਨ, ਲਿੰਗ, ਪੁਰਖ, ਕਾਲ, ਕਾਰਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<b>Semester -3</b>	
<b>Gurmat Sangeet (Major) (Theory) - 3(MGS-201)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of classification of ragas used in gurmat sangeet.</li> <li>2. Acquire the detailed Knowledge of classification of ancient times and its application in Gurmat sangeet.</li> <li>3. Acquire the knowledge of folk element in Gurmat sangeet.</li> <li>4. Student will be able to learn about the description of the prescribed ragas and along with comparative study.</li> </ol>
<b>Gurmat Sangeet (Major) (Practical) - 3(MGS-202)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of singing style of dhrupad.</li> <li>2. Student will be able to sing the kirtan of Aarti.</li> <li>3. The student will be able to sing Manglacharan in the Vilambit khyal style.</li> <li>4. The student will have exposure of new ragas and new taals.</li> </ol>
<b>Tabla (Minor) MTB – 203</b>	<ol style="list-style-type: none"> <li>1. Revision of 1<sup>st</sup> and 2<sup>nd</sup> semester syllabus (Practical Portion).</li> <li>2. Ability to demonstrate EKtaal, Jhaptaal, Pauritaal and Deepchandi on hand as well as Tabla (in than &amp; dugunlayakaries) with description.</li> <li>3. Ability to play two prakars in each Talas.</li> <li>4. Ability to play Vilambitteentaal and VilambitEkTaal (in simple form).</li> <li>5. Ability to play 2 -2 laggies and tihais in Keherva and Dadra taal</li> <li>6. Viva</li> </ol>



<b>Compulsory English Eng - 201</b>	<ol style="list-style-type: none"> <li>1. To trace the development history of English Literature.</li> <li>2. To interpret the text from contemporary point of view.</li> <li>3. To critically analysis these text as a source of wisdom.</li> <li>4. To provide them knowledge of English Grammar as, types of clause, translation, complex and compound sentences.</li> <li>5. To develop critical thinking and imagination through long and short stories, poems and drama.</li> </ol>
<b>Lazmi Punjabi Pbi- 214</b>	<ol style="list-style-type: none"> <li>1. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ+ਗੁਰੂ ਸਾਹਿਬਾਨਾਂ ਦੀ ਬਾਣੀ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>2. ਇੱਕ ਐਤਵਾਰ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਨਵਾਂ ਚਾਨਣ, ਡਾਕਟਰ ਪਲਟਾ) ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>3. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤਮਾਨ ਹਾਲਤ (ਸਾਹਿਤ, ਮੀਡੀਆ ਅਤੇ ਵਿੱਦਿਅਕ ਅਦਾਰਿਆਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ)</li> <li>4. ਧੁਨੀ ਵਿਗਿਆਨ ਅਤੇ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਵਰਗੀਕਰਨ ਅਤੇ ਅੰਤਰ-ਨਿਖੇੜ। ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ : ਖੰਡੀ ਅਤੇ ਅਖੰਡੀ ਧੁਨੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>5. ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ ਲੇਖਣ ਦਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>
<b>Semester - 4</b>	
<b>Gurmat Sangeet (Major) (Theory) – 4 (MGS-221)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of Raag Vargikaran system from medieval to modern period.</li> <li>2. Acquire the knowledge of important concepts of Indian classical music related to time theory.</li> <li>3. Acquire the knowledge of Partaal style of singing and its theoretical aspect.</li> </ol>

	<p>4. Acquire the knowledge of derivation of 484 ragas from one that.</p> <p>5. Grammatical and theoretical aspect of prescribed ragas and taals.</p>
<b>Gurmat Sangeet (Major) (Practical) – 4 (MGS-222)</b>	<p>1. Student will be able to sing in Partaal style.</p> <p>2. Student will be able to demonstrate Manglacharan in Vilambit laya.</p> <p>3. Student will be able to Perform Sodar Chownki in Traditional Style.</p> <p>4. Student will be able to perform Shabads in Prescribed ragas and taals.</p> <p>5. The students will be able to learn the technique of playing Tanpura.</p>
<b>Tabla (Minor) - 4 MTB 223</b>	<p>1. Revision of 3<sup>rd</sup> Semester Syllabus.</p> <p>2. Ability to play TivraTaal (in thah and dugun laykaries).</p> <p>3. Ability to play one Kaida, four paltas and one tihai in Teentaal .</p> <p>4. Proficiency in TaalPehchan.</p> <p>5. Viva</p>
<b>Compulsory English ENG - 221</b>	<p>1. To equip them to attempt practical criticism of plays, passages and poems To read and appreciate stories on their own.</p> <p>2. To develop a comparative perspective to study the texts</p> <p>3. To recognise and discuss the aspects of an author.</p>
<b>Lazmi Punjabi Pbi- 224</b>	<p>1. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਸੂਫੀ ਕਾਵਿ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ (ਸ਼ਾਹ ਹੁਸੈਨ ਦੀਆਂ ਕਾਫ਼ੀਆਂ+ਹੀਰ ਦਮੋਦਰ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>2. ਪਾਠ-ਪੁਸਤਕ - ਮੰਚ ਦਰਸ਼ਨ ਵਿਚੋਂ ਅਗਲੀਆਂ ਪੰਜ ਇਕਾਂਗੀਆਂ ( ਗਊਮੁਖਾ-ਸ਼ੇਰਮੁਖਾ, ਜੈਲਦਾਰ, ਇਕ ਵਿਚਾਰੀ ਮਾਂ, ਅੰਨ੍ਹੇ ਨਿਸ਼ਾਨਚੀ, ਚਾਬੀਆਂ) ਦੇ ਆਧਾਰ 'ਤੇ ਪੰਜਾਬੀ ਇਕਾਂਗੀ ਬਾਰੇ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</p>

	3. ਸ਼ਬਦ ਵਿਗਿਆਨ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਅਤੇ ਰਚਨਾ; ਪੰਜਾਬੀ ਭਾਵੇਂਸ਼ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ। 4. ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਅਤੇ ਸਮੱਸਿਆਵਾਂ। 5. ਇਸ਼ਤਿਹਾਰ, ਪ੍ਰੈੱਸ ਨੋਟ ਅਤੇ ਖ਼ਬਰਾਂ : ਲਿਖਣ ਦੀਆਂ ਵਿਧੀਆਂ ਅਤੇ ਨੇਮਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>Semester -5</b>	
<b>Gurmat Sangeet (Major) (Theory) – 5 (MGS-301)</b>	1. Acquire the knowledge of important banis of shri guru granth sahib ji. 2. Acquire the knowledge of importance of musical instruments in Gurmat sangeet. 3. Acquire the knowledge of Voice Culture and its Various aspects. 4. Acquire the knowledge of Contribution of Bhagats in Gurmat sangeet. 5. Acquire the interim description of parts Tanpura, its playing posture and it's tuning.
<b>Gurmat Sangeet (Major) (Practical) – 5 (MGS-302)</b>	1. Being able to sing Manglacharan in prescribed ragas. 2. Being able to sing Partaal in prescribed ragas. 3. Being able to shabad reets in different taals. 4. Student will be able to perform the kirtan of lavaans. 5. Student will be able to learn the playing technique of changing scale on harmonium from 4 <sup>th</sup> black to 1 <sup>st</sup> white and 2 <sup>nd</sup> black. 6. Student will able to sing welcome song.
<b>Tabla (Minor) -5 MTB 303</b>	1. Ability to play chartaal and Sooltaal. 2. Ability to play 2 ChakkardarParam in Teentaal and Japhtaal 3. Ability to play Uthaan of teentaal and Chartaal. 4. 2 Laggies, Ladi and Tihaies in Keherwa and Dadra taal.

	<ol style="list-style-type: none"> <li>5. Proficiency in Taal- Pehchan.</li> <li>6. Viva</li> </ol>
<b>Compulsory English Eng - 301</b>	<ol style="list-style-type: none"> <li>1. Enable students to understand various kinds of business communication tactics and to use them in professional sphere.</li> <li>2. Make students able to read and understand poetry by enhancing their critical ability.</li> <li>3. Make them able to inculcate habits of pleasurable reading with the help of novel reading.</li> <li>4. To learn to use grammar correctly.</li> </ol>
<b>Lazmi Punjabi Pbi- 314</b>	<ol style="list-style-type: none"> <li>1. ਨਾਵਲ : ਸੁੰਦਰੀ ( ਭਾਈ ਵੀਰ ਸਿੰਘ) ਦਾ ਪਾਠਗਤ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ ਕਰਵਾਉਣਾ।</li> <li>2. ਪਾਠ-ਪੁਸਤਕ - ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਵਿਚਲੇ ਲੇਖਾਂ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ।</li> <li>3. ਵਾਕ-ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ; ਰੂਪ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਾਕ ਵੰਡ- ਸਧਾਰਨ, ਸੰਯੁਕਤ, ਮਿਸ਼ਰਤ। ਕਾਰਜ ਦੇ ਅਧਾਰ ਤੇ ਵਾਕ ਵੰਡ- ਬਿਆਨੀਆ, ਸਵਾਲੀਆ ਅਤੇ ਹੁਕਮੀ ਵਾਕ।</li> <li>4. ਸੰਚਾਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸੰਚਾਰ ਸਾਧਨ: ਪ੍ਰਿੰਟ ਅਤੇ ਬਿਜਲਈ ਮੀਡੀਆ (ਅਖ਼ਬਾਰ, ਰਸਾਲੇ, ਰੇਡੀਓ, ਟੈਲੀਵਿਜ਼ਨ, ਕੰਪਿਊਟਰ ਅਤੇ ਇੰਟਰਨੈੱਟ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਲਈ ਯੋਗਦਾਨ)</li> <li>5. ਕਿਸੇ ਅਣਡਿੱਠੇ ਪੈਰੇ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਅਤੇ ਸੰਖੇਪ-ਰਚਨਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>
<b>Value Education, Ethics &amp; Human Rights GSES -301</b>	<ol style="list-style-type: none"> <li>1. Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being.</li> <li>2. To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order</li> <li>3. To learn about Professional ethics and issues in professional ethics.</li> </ol>
<b>Semester - 6</b>	

<b>Gurmat Sangeet (Major) (Theory) – 6 (MGS-321)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of elements of gayaki use in Indian classical music.</li> <li>2. Acquire the knowledge of important baanis of Shri guru Granth sahib ji.</li> <li>3. Acquire the knowledge of taal system and its importance in Music.</li> <li>4. Critical study of Notation system.</li> <li>5. Acquire the knowledge of theoretical aspect of teaching.</li> <li>6. Role and importance of MUSIC in Human beings.</li> <li>7. Acquire the knowledge of prescribed ragas and taals.</li> </ol>
<b>Gurmat Sangeet (Major) (Practical) – 6 (MGS-322)</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of singing shabad with Tanpura in given ragas.</li> <li>2. Being able to sing Manglacharan on prescribed ragas.</li> <li>3. Being able to sing in the partaal style in the given ragas.</li> <li>4. The student will be able to perform Saraswati Vandana.</li> <li>5. Student will learn the art of self composition in different taals.</li> <li>6. Students will be able to perform with Tanpura.</li> <li>7. Student will be able to play and sing National Anthem.</li> </ol>
<b>Tabla Minor -6 MTB 323</b>	<ol style="list-style-type: none"> <li>1. Revision of all the previous semester's syllabus.</li> <li>2. Ability to play 2 Laggi, Ladi and Tihai in Keherwa, Dadra Roopak and Deepchanditaal.</li> <li>3. Proficiency in Taal- Pehchan.</li> <li>4. Solo performance in Teentaal (Duration 10 minutes) 2 Uthaan, 2 Kaidas with 6 Paltas, 2 TihaisMukhda and Mohraetc</li> <li>5. Knowledge of Theka of National Anthem.</li> <li>6. Viva</li> </ol>
<b>Compulsory English Eng - 321</b>	<ol style="list-style-type: none"> <li>1. To explore different genres and inculcate critical powers by looking at their meticulous details.</li> </ol>

	<ol style="list-style-type: none"> <li>2. To analyse various types of genres ranging from poetry to drama with reference to thematic and other approaches.</li> <li>3. Enable students to have a peep into the phonetic system of English language by using intonation and stress pattern.</li> <li>4. To teach syllable structure and syllable division by focusing on mono and disyllabic words.</li> <li>5. To teach them to use grammar correctly.</li> </ol>
<b>Lazmi Punjabi Pbi- 324</b>	<ol style="list-style-type: none"> <li>1. ਪਾਠ-ਪੁਸਤਕ - ਯਾਦਾਂ ਦੀ ਕੰਨੀ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਰਤਕ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>2. ਪਾਠ-ਪੁਸਤਕ - ਵਾਰਤਕ ਵਿਵੇਕ ਦੇ ਆਧਾਰ 'ਤੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਵਿਸ਼ਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>3. ਭਾਸ਼ਾ-ਵਿਗਿਆਨਕ ਸ਼ਬਦਾਵਲੀ: ਦੁਭਾਸ਼ਾਵਾਦ, ਬਹੁਭਾਸ਼ਾਵਾਦ, ਮਾਂ-ਬੋਲੀ, ਦੂਜੀ ਭਾਸ਼ਾ, ਸਰਕਾਰੀ ਭਾਸ਼ਾ।</li> <li>4. ਅਰਥ-ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੋੜ, ਅਰਥ ਵਿਸਤਾਰ ਅਤੇ ਸੰਕੋਚ, ਅਰਥ ਉਤਰਾਅ ਅਤੇ ਚੜ੍ਹਾਅ</li> <li>5. ਪੈਰਾ ਅਨੁਵਾਦ : ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ (ਪੈਰਾ ਲਗਭਗ 100-125 ਸ਼ਬਦਾਂ ਦਾ ਹੋਵੇ)ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>
<b>Environmental Studies GSES - 321</b>	<ol style="list-style-type: none"> <li>1. To understand the need for public awareness for environment.</li> <li>2. To learn about renewable and non-renewable resources, problems associated with Natural resources.</li> <li>3. To know about ecosystems, structure and function of an ecosystem.</li> <li>4. Understand biodiversity and impact on environment, conservations of bio resources.</li> <li>5. Environmental pollution and causes and remedies.</li> </ol>



<b>B.A. Honors Tabla (Major)</b>	
<b>Programme Outcomes</b>	<ol style="list-style-type: none"> <li>1. To be able to develop performing skills for practical presentation of Tabla.</li> <li>2. To be able to secure employment as Music teacher at PGT &amp; TGT level in the discipline.</li> <li>3. To be able to persue the discipline in high education and attain expertise as Performer.</li> <li>4. The student will be able to develop performing skills thereby enhancing career opportunities through social media like you tube, Facebook &amp; Instagram etc.</li> </ol>
<b>Programme Specific Outcomes</b>	<ol style="list-style-type: none"> <li>1. Students will be able to Perform the various practical aspects of the instrumental presentation in Solo Tabla.</li> <li>2. being able to perform in Various taals.</li> <li>3. Being aware of the in-depth knowledge of theoretical aspects of the discipline.</li> <li>4. Being able to work as accompaniment with different genre of Music like Indian Classical Music, GUrmat Sangeet and Light Music etc.</li> <li>5. being able to develop fluency in playing Tabla.</li> </ol>
	Sesmester 1
<b>MTB Tabla (major theory-1) -101 Ist Sem</b>	<ol style="list-style-type: none"> <li>1. Knowledge of producing the following vermas. Na, Tin Tu Din Te Ta Dhe,</li> <li>2. Ability to demonstrate different layakaries e.g Thah, Dugum and Chaugun, Teentaal Rupaktaal</li> <li>3. Ability to give stage performance in Teentaal with lehra for (10 minutes).</li> <li>4. Basic knowledge of origin of Tabla.</li> </ol>

	<ol style="list-style-type: none"> <li>Importance of Lay and Taal in music.</li> <li>Proficiency of taal Pahchaan.</li> </ol>
<b>MTB - 102 Tabla Major Practical 1</b>	<ol style="list-style-type: none"> <li>Knowledge of producing the following vermas. Na, Tin Tu Din Te Ta Dhe,</li> <li>Ability to demonstrate different layakaries e.g Thah, Dugum and Chaugun, Teentaal Rupaktaal</li> <li>Ability to give stage performance in Teentaal with lehra for (10 minutes).</li> <li>Basic knowledge of origin of Tabla.</li> </ol>
<b>MGS- 103 Gurmat Sangeet (Minor -1)</b>	<ol style="list-style-type: none"> <li>Acquire the knowledge of technical terms used in indian music.</li> <li>Student will be able to sing Alankars in basics thaats.</li> <li>Student will be able to sing Asa Di Vaar (First 12 chakkas) in simple tune.</li> <li>Student will be able to sing simple Shabad tunes with harmonium in Kehrwa taal.</li> <li>Student will be able to recite poem based on Baisakhi.</li> </ol>
<b>Compulsory English ENG-101</b>	<ol style="list-style-type: none"> <li>To Understand the correct application of the subject.</li> <li>To enrich their vocabulary</li> <li>To Develop beginning vocabulary and aesthetic sense both</li> <li>Learn to make coherent sentences and propound coherent ideas</li> <li>Close Reading and critical analysis of the Text</li> </ol>
<b>Lazmi Punjabi PBI- 114</b>	<ol style="list-style-type: none"> <li>ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਭਾਈ ਵੀਰ ਸਿੰਘ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਕ, ਪੂਰਨ ਸਿੰਘ, ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਫੀਰ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਹਰਿਭਜਨ ਸਿੰਘ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸਤਾਈ ਜਨਵਰੀ, ਮੁੜ ਵਿਧਵਾ, ਪਠਾਣ ਦੀ ਧੀ, ਤ੍ਰਿਸ਼ਨਾ, ਭੇਤ ਵਾਲੀ ਗੱਲ, ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ, ਇਕ ਬਾਲੜੀ ਦੇ ਪਤਾਸੇ, ਮੋਹੜੀ) ਦੇ ਸੰਦਰਭ</li> <li>ਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ, ਉਪਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ-ਸੰਬੰਧ,</li> </ol>

	<p>ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਈ ਵੰਨਗੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>8. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ-ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ, ਵਿਸਮਿਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<b>Semester 2<sup>nd</sup></b>	
<b>MTB Tabla (major Theory - 2) – 121 2<sup>nd</sup> Sem</b>	<ol style="list-style-type: none"> <li>1. Elementary Knowledge of tuning the instrument 'Tabla'</li> <li>2. Students will be able to play a Chakradar Tukra, Paran and Tehai.</li> <li>3. Teental, two Kaidas with six paltas, two Mukhdas, Two Mohras, one Uthan.</li> <li>4. Accompany with second semester Gurmat Sangeet/ Music Instrumental (Major) class. Practice of playing Nagma on harmonium in Teentaal.</li> <li>5. Comparison between Tabla and Pakhawaj</li> <li>6. Proficiency of taal Pachan.</li> </ol>
<b>MTB- 122 Tabla (Major Practical)</b>	<ol style="list-style-type: none"> <li>1. Elementary Knowledge of tuning the instrument 'Tabla'</li> <li>2. Students will be able to play a Chakradar Tukra, Paran and Tehai.</li> <li>3. Teental, two Kaidas with six paltas, two Mukhdas, Two Mohras, one Uthan.</li> </ol>
<b>Gurmat Sangeet (Minor- 2) MGS -123</b>	<ol style="list-style-type: none"> <li>1. Student will be able to sing 10 alankars in 3 Thaats.</li> <li>2. Acquire the knowledge of basic concepts of Gurmat Sangeet and its Comparison with indian Music.</li> <li>3. Students will be able to sing simple shabad tunes with Harmonium in Dadra taal.</li> <li>4. Student will be able to sing Asa Di Vaar (Next 12 chakkas) in simple tune.</li> <li>5. Acquire the knowledge of Banis of Shri Guru Granth sahib ji.</li> <li>6. Student will be Aware of Salient Feature of Gurmat Sangeet.</li> </ol>

	7. Student will be able to sing poem on Martyrdom of Chotte Sahibzade.
<b>Compulsory English ENG-121</b>	6. To enhance the critical thinking of the students with the help of poetry and essays. 7. To read and appreciate the beauty of stories on their own. 8. To teach them the intricacies of grammar so that they can make sentences on their own without any grammatical errors. 9. Enable them to understand the difference between formal and informal communication with the help of letter writing. 10. To enlighten and aware students about the literary characteristics of various poetic forms.
<b>Lazmi Punjabi PBI- 124</b>	5. ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸ.ਸ. ਮੀਸ਼ਾ, ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ, ਰਵਿੰਦਰ ਰਵੀ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼, ਹਰਿਭਜਨ ਹਲਵਾਰਵੀ, ਮਨਜੀਤ ਟਿਵਾਣਾ ਦੀ ਕਵਿਤਾ ਦੇ ਹਾਵਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 6. ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸ਼ਹੀਦ, ਜਿਊਣ ਜੇਗੇ, ਮੂਨ ਦੀ ਅੱਖ, ਇੱਕੀਵੀਂ ਸਦੀ, ਬਠਲੂ ਚਮਿਆਰ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ, ਡੁੰਮ) ਦੇ ਸੰਦਰਭ ਵਿਚ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 7. ਗੁਰਮੁਖੀ ਲਿਪੀ: ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸੰਬੰਧ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 8. ਵਿਆਕਰਨਿਕ ਸ਼੍ਰੇਣੀਆਂ: ਲੋੜ, ਮਹੱਤਵ ਅਤੇ ਮੁੱਖ ਸੰਕਲਪ - ਵਚਨ, ਲਿੰਗ, ਪੁਰਖ, ਕਾਲ, ਕਾਰਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>Semester 3<sup>rd</sup></b>	
<b>MTB – 201 3<sup>rd</sup> Sem</b>	1. Defining the following musical terms Aa, Upaj, Solo Vadan, Ganda-Bandhan, Nagma, 2. Suggestions on the progress of Tabla Solo Vadan. 3. Brief life Sketches of the following Guru, Pandit Kishan Maharaj, Ustad, Allah Rakha Khan.

	<ol style="list-style-type: none"> <li>4. Defining the different Gharanas of Tabla.</li> <li>5. Difference between Gharana and Baaj in short</li> <li>6. Proficiency in Taal Pehchaan.</li> </ol>
<b>MTB-202 Tabla Major Practical- 3</b>	<ol style="list-style-type: none"> <li>1. Defining the following musical terms Aa, Upaj, Solo Vadan, Ganda-Bandhan, Nagma,</li> <li>2. Suggestions on the progress of Tabla Solo Vadan.</li> <li>3. Defining the different Gharanas of Tabla.</li> </ol>
<b>Gurmat Sangeet (Minor – 3) MGS -203</b>	<ol style="list-style-type: none"> <li>1. Student will be able to sing 10 Alankars in 3 Thaats.</li> <li>2. Student will be able to sing So-dar and Aarti.</li> <li>3. Student will be able to sing poem on Sikh itihās.</li> <li>4. Student will be able to sing Anand sahib in simple tune.</li> <li>5. Student will be able to sing Shabad Reets in Kehrwa , Dadra and Roopak taal.</li> <li>6. Student will be able to demonstrate taals on hand beats.</li> </ol>
<b>Compulsory English ENG 201</b>	<ol style="list-style-type: none"> <li>6. To trace the development history of English Literature.</li> <li>7. To interpret the text from contemporary point of view.</li> <li>8. To critically analysis these text as a source of wisdom.</li> <li>9. To provide them knowledge of English Grammar as, types of clause, translation, complex and compound sentences.</li> <li>10. To develop critical thinking and imagination through long and short stories, poems and drama.</li> </ol>
<b>Lazmi Punjabi PBI- 214</b>	<ol style="list-style-type: none"> <li>6. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ+ਗੁਰੂ ਸਾਹਿਬਾਨਾਂ ਦੀ ਬਾਣੀ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>7. ਇੱਕ ਐਤਵਾਰ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਨਵਾਂ ਚਾਨਣ, ਡਾਕਟਰ ਪਲਟਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>8. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤਮਾਨ ਹਾਲਤ (ਸਾਹਿਤ, ਮੀਡੀਆ ਅਤੇ ਵਿੱਦਿਅਕ ਅਦਾਰਿਆਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ)</li> <li>9. ਧੁਨੀ ਵਿਗਿਆਨ ਅਤੇ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਵਰਗੀਕਰਨ ਅਤੇ ਅੰਤਰ-ਨਿਖੇੜ। ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ : ਖੰਡੀ ਅਤੇ ਅਖੰਡੀ ਧੁਨੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> </ol>

	10. ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ ਲੇਖਣ ਦਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।
<b>Semester 4<sup>th</sup></b>	
<b>MTB – 221 4<sup>th</sup> Sem</b>	<ol style="list-style-type: none"> <li>1. Life Sketch of Pt. Samta Parsad, Pt Ram Sahai.</li> <li>2. Detailed study of Partel Gayan Shalley.</li> <li>3. Being knowledge of Jhoomrataal, PunchamSwaritaal, Addha-taal and Jat-taal Thah, Dugun, Tigun and Aad Laykaries.</li> <li>4. Merits and demerits of teaching music in institution.</li> <li>5. Ten Praans of Taal</li> <li>6. Teentaal, Rupaktaal, Ektaal performance with Lehras.</li> </ol>
<b>MTB – 222 Tabla Major Practical - 4</b>	<ol style="list-style-type: none"> <li>1. Life Sketch of Pt. Samta Parsad, Pt Ram Sahai.</li> <li>2. Detailed study of Partel Gayan Shalley.</li> <li>3. Merits and demerits of teaching music in institution.</li> </ol>
<b>MGS – 223 Gurmat Sangeet (minor - 4)</b>	<ol style="list-style-type: none"> <li>1. Student will be able to sing one raag 4-4 Alaaps and tans.</li> <li>2. Student will be able to sing Shabad Reets in Deepchandi taal.</li> <li>3. Student will be able to sing welcome song.</li> <li>4. Student will be able to sing National Anthem.</li> <li>5. Student will be Able to recite Gurmantra jaap in simple tune.</li> </ol>
<b>Compulsory English ENG - 221</b>	<ol style="list-style-type: none"> <li>4. To equip them to attempt practical criticism of plays, passages and poems To read and appreciate stories on their own.</li> <li>5. To develop a comparative perspective to study the texts</li> <li>6. To recognise and discuss the aspects of an author.</li> </ol>
<b>Lazmi Punjabi PBI – 224</b>	<ol style="list-style-type: none"> <li>6. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਸੂਫੀ ਕਾਵਿ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ (ਸ਼ਾਹ ਹੁਸੈਨ ਦੀਆਂ ਕਾਫ਼ੀਆਂ+ਹੀਰ ਦਮੋਦਰ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>7. ਪਾਠ-ਪੁਸਤਕ - ਮੰਚ ਦਰਸ਼ਨ ਵਿਚੋਂ ਅਗਲੀਆਂ ਪੰਜ ਇਕਾਂਗੀਆਂ (ਗਊਮੁਖਾ-ਸ਼ੇਰਮੁਖਾ, ਜ਼ੈਲਦਾਰ, ਇਕ ਵਿਚਾਰੀ ਮਾਂ, ਅੰਨ੍ਹੇ ਨਿਸ਼ਾਨਚੀ, ਚਾਬੀਆਂ) ਦੇ ਆਧਾਰ 'ਤੇ ਪੰਜਾਬੀ ਇਕਾਂਗੀ ਬਾਰੇ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>8. ਸ਼ਬਦ ਵਿਗਿਆਨ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਅਤੇ ਰਚਨਾ; ਪੰਜਾਬੀ ਭਾਵੇਂਸ਼ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ।</li> </ol>



	<p>9. ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਅਤੇ ਸਮੱਸਿਆਵਾਂ।</p> <p>10. ਇਸ਼ਤਿਹਾਰ, ਪ੍ਰੈੱਸ ਨੋਟ ਅਤੇ ਖ਼ਬਰਾਂ : ਲਿਖਣ ਦੀਆਂ ਵਿਧੀਆਂ ਅਤੇ ਨੇਮਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<b>Semester 5<sup>th</sup></b>	
<b>MTB – 301 5<sup>th</sup> Sem</b>	<ol style="list-style-type: none"> <li>1. Detail study of Principles of Sangat.</li> <li>2. Ability to write all the practical portion of V Semester.</li> <li>3. Knowledge of 'North Indian Tall Rachna Sidhant' with ability to form new Taalas.</li> <li>4. Comparative study in same beats (matras) of taal.</li> <li>5. Ability to play a Rela of Teentaal with Dhir- Dhir Bols.</li> <li>6. Ability to give stage&amp; performance in Jhaaptaal, Ektaal, Rupaktaal, Teentaal.</li> </ol>
<b>MTB – 302 Tabla Major Practical -5</b>	<ol style="list-style-type: none"> <li>1. Ability to write all the practical portion of V Semester.</li> <li>2. Ability to play a Rela of Teentaal with Dhir- Dhir Bols.</li> <li>3. Ability to give stage&amp; performance in Jhaaptaal, Ektaal, Rupaktaal, Teentaal</li> </ol>
<b>MGS – 303 Gurmat Sangeet( Minor -5)</b>	<ol style="list-style-type: none"> <li>1. Student will be able to sing Raag Bhairav with 4-4 Alaaps and tans.</li> <li>2. Student will be able to sing patriotic song.</li> <li>3. Student will be able to sing Choupai sahib in simple tune.</li> <li>4. Student will be able to sing shabad reets based on birth and death ceremonies.</li> <li>5. Student will be able to demonstrate taal on hand beats.</li> </ol>
<b>Compulsory English ENG - 301</b>	<ol style="list-style-type: none"> <li>5. Enable students to understand various kinds of business communication tactics and to use them in professional sphere.</li> <li>6. Make students able to read and understand poetry by enhancing their critical ability.</li> <li>7. Make them able to inculcate habits of pleasurable reading with the help of novel reading.</li> <li>8. To learn to use grammar correctly.</li> </ol>

<b>Lazmi Punjabi PBI – 314</b>	<ol style="list-style-type: none"> <li>6. ਨਾਵਲ : ਸੁੰਦਰੀ ( ਭਾਈ ਵੀਰ ਸਿੰਘ) ਦਾ ਪਾਠਗਤ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ ਕਰਵਾਉਣਾ।</li> <li>7. ਪਾਠ-ਪੁਸਤਕ - ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਵਿਚਲੇ ਲੇਖਾਂ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ।</li> <li>8. ਵਾਕ-ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ; ਰੂਪ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਾਕ ਵੰਡ- ਸਧਾਰਨ, ਸੰਯੁਕਤ, ਮਿਸ਼ਰਤ। ਕਾਰਜ ਦੇ ਆਧਾਰ ਤੇ ਵਾਕ ਵੰਡ- ਬਿਆਨੀਆ, ਸਵਾਲੀਆ ਅਤੇ ਹੁਕਮੀ ਵਾਕ।</li> <li>9. ਸੰਚਾਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸੰਚਾਰ ਸਾਧਨ: ਪ੍ਰਿੰਟ ਅਤੇ ਬਿਜਲਈ ਮੀਡੀਆ (ਅਖ਼ਬਾਰ, ਰਸਾਲੇ, ਰੇਡੀਓ, ਟੈਲੀਵਿਜ਼ਨ, ਕੰਪਿਊਟਰ ਅਤੇ ਇੰਟਰਨੈੱਟ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਲਈ ਯੋਗਦਾਨ)</li> <li>10. ਕਿਸੇ ਅਣਡਿੱਠੇ ਪੈਰੇ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਅਤੇ ਸੰਖੇਪ-ਰਚਨਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>
<b>GSES - 301 Value Education, Ethics and Human Rights</b>	<ol style="list-style-type: none"> <li>4. Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being.</li> <li>5. To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order</li> <li>6. To learn about Professional ethics and issues in professional ethics.</li> </ol>
<b>Semester 6</b>	
<b>MTB – 321 6<sup>th</sup> Sem</b>	<ol style="list-style-type: none"> <li>1. Ability to understand to play and differentiate between Khule and Band Bolas.</li> <li>2. Technical aspects of the following Vadan –Shallies.</li> <li>3. Ability to give stage &amp; performance in Jhaptal, Rupaktaal, Ektaal, Teentaal.</li> <li>4. Ability to play’Baant’ of laggies in Dadra, Keherwa, Roopak and jhaptal.</li> <li>5. Oral rendering of practical portion.</li> <li>6. Comparative study in same beats (matras) of taal.</li> </ol>

<b>MTB – 322 (Tabla Major practical -6)</b>	<ol style="list-style-type: none"> <li>1. Ability to understand to play and differentiate between Khule and Band Bolas.</li> <li>2. Technical aspects of the following Vadan –Shallies.</li> <li>3. Ability to play 'Baant' of laggies in Dadra, Keherwa, Roopak and jhaptaal.</li> </ol>
<b>MGS – 323 Gurmat Sangeet( Minor -6)</b>	<ol style="list-style-type: none"> <li>1. Student will be able to perform raag kalia with Alaaps and Taans.</li> <li>2. Student will be able to recite a poem in Dhadhi Waaran poem.</li> <li>3. Student will be able to compose shabad reets by own self.</li> <li>4. Student will be able to sing shabad reets in Different taals.</li> <li>5. Student will be able to recite So-dar Chownki</li> </ol>
<b>Compulsory English ENG – 321</b>	<ol style="list-style-type: none"> <li>6. To explore different genres and inculcate critical powers by looking at their meticulous details.</li> <li>7. To analyse various types of genres ranging from poetry to drama with reference to thematic and other approaches.</li> <li>8. Enable students to have a peep into the phonetic system of English language by using intonation and stress pattern.</li> <li>9. To teach syllable structure and syllable division by focusing on mono and disyllabic words.</li> <li>10. To teach them to use grammar correctly.</li> </ol>
<b>Lazmi Punjabi PBI – 324</b>	<ol style="list-style-type: none"> <li>6. ਪਾਠ-ਪੁਸਤਕ - ਯਾਦਾਂ ਦੀ ਕੰਨੀ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਰਤਕ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>7. ਪਾਠ-ਪੁਸਤਕ - ਵਾਰਤਕ ਵਿਵੇਕ ਦੇ ਆਧਾਰ 'ਤੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਵਿਸ਼ਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>8. ਭਾਸ਼ਾ-ਵਿਗਿਆਨਕ ਸ਼ਬਦਾਵਲੀ: ਦੁਭਾਸ਼ਾਵਾਦ, ਬਹੁਭਾਸ਼ਾਵਾਦ, ਮਾਂ-ਬੋਲੀ, ਦੂਜੀ ਭਾਸ਼ਾ, ਸਰਕਾਰੀ ਭਾਸ਼ਾ।</li> <li>9. ਅਰਥ-ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੋੜ, ਅਰਥ ਵਿਸਤਾਰ ਅਤੇ ਸੰਕੋਚ, ਅਰਥ ਉਤਰਾਅ ਅਤੇ ਚੜ੍ਹਾਅ</li> <li>10. ਪੈਰਾ ਅਨੁਵਾਦ : ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ (ਪੈਰਾ ਲਗਭਗ 100-125 ਸ਼ਬਦਾਂ ਦਾ ਹੋਵੇ)ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>

<b>GSES Environmental Studies GSES - 321</b>	<ol style="list-style-type: none"> <li>6. To understand the need for public awareness for environment.</li> <li>7. To learn about renewable and non-renewable resources, problems associated with Natural resources.</li> <li>8. To know about ecosystems, structure and function of an ecosystem.</li> <li>9. Understand biodiversity and impact on environment, conservations of bio resources.</li> <li>10. Environmental pollution and causes and remedies.</li> </ol>
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<b>B.A. Honors Music (Instrumental)</b>	
<b>Semester 1</b>	
<b>B.A (Hons)) Music- Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. To be able to develop performing skills for practical presentation of Instrumental in Hindustani classical Genre.</li> <li>2. To be able to secure employment as Music teacher at PGT &amp; TGT level in the discipline.</li> <li>3. To be able to persue the discipline in high education and attain expertise as Performa.</li> <li>4. The student will be able to develop performing skills enhancing career opportunities through social media like you tube, Facebook &amp; Instagram etc.</li> </ol>
<b>Programme Specific Outcome</b>	<ol style="list-style-type: none"> <li>1. Students will be able to Perform the various practical aspects of the instrumental presentation in Indian classical Music.</li> <li>2. being able to perform in Various taals.</li> <li>3. Being aware of the in-depth knowledge of theoretical aspects of the discipline.</li> <li>4. Being able to give presentation in different Ragaas as well as light Dhun.</li> <li>5. being able to develop fluency in playing music instrument.</li> </ol>
<b>Course Outcome MMI-101 Music Instrumental (major theory -1)</b>	<ol style="list-style-type: none"> <li>1. Require to know what the basic terminologies of Indian Music which will help him in the proper understanding of not just Hindustani music.</li> <li>2. Having understood the basic concepts like Laya, Tala, Raaga, and the students will be on course to becoming a performing artist in Hindustani music.</li> </ol>
<b>Course Outcome MMI-102 Music Instrumental (major practical -1)</b>	<ol style="list-style-type: none"> <li>6. The students will know how to tune their Instruments.</li> <li>7. The students will become well- versed with the teqniques of playing.</li> </ol>

	8. Having learnt the Notation System in the theory, the student will be able to read and learn new composition in the prescribed Ragas.
<b>Tabla (Minor-1) MTB-103</b>	9. Knowledge of varn of tabla. 10. Define the music term, Theka, Taal, Taali, Khaali, Vibhag. 11. Knowledge of origin of Tabla. 12. Teentaal, Kahrva taal Thah and Dugun. 13. Dadra, Rupak Theka Prakaar. 14. Knowledge of Bhatkhande Taal Notation system
<b>Compulsory English Eng - 101</b>	11. To Understand the correct application of the subject. 12. To enrich their vocabulary 13. To Develop beginning vocabulary and aesthetic sense both 14. Learn to make coherent sentences and propound coherent ideas 15. Close Reading and critical analysis of the Text
<b>Lazmi Punjabi Pbi- 114</b>	9. ਪ੍ਰਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਭਾਈ ਵੀਰ ਸਿੰਘ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਕ, ਪੂਰਨ ਸਿੰਘ, ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਫ਼ੀਰ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਹਰਿਭਜਨ ਸਿੰਘ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 10. ਪ੍ਰਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸਤਾਈ ਜਨਵਰੀ, ਮੁੜ ਵਿਧਵਾ, ਪਠਾਣ ਦੀ ਧੀ, ਤ੍ਰਿਸ਼ਨਾ, ਭੇਤ ਵਾਲੀ ਗੱਲ, ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ, ਇਕ ਬਾਲੜੀ ਦੇ ਪਤਾਸੇ, ਮੋਹੜੀ) ਦੇ ਸੰਦਰਭ 11. ਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ, ਉਪਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ-ਸੰਬੰਧ, ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਈ ਵੰਨਗੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 12. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ-ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ, ਵਿਸਮਿਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
	<b>Semester 2</b>
<b>Course Outcome MMI-121 ( Music Instrumental (major theory -2)</b>	1. The students will know the origin and development of own Instrument. 2. They come to understand the concept of Tala and the use of various taals in Hindustani music, especially Ragas.
<b>Course Outcome MMI – 122 Music Instrumental (major practical -1)</b>	1. The students will learn the art of playing that on own Instruments. 2. The student will know how to play Maseetkhani& Vilambit Gat with simple alap and todas to own Instruments.



<b>Tabla (Minor -2) MTB - 123</b>	<ol style="list-style-type: none"> <li>Define the following musical terms, Avartan, Matra, Mohra, Tihai laya.</li> <li>Ability to demonstrate different layaKaries in Dadra, Keherwa Rupak and Teentaal Thah and Dugun with description.</li> <li>Ability to play following taals on with the prakars in each: Dadra, Keherwa, Roopak and Teental (different from previous semester)</li> <li>Ability to play one Tihai and Mohra each in the above mentioned Taalas</li> <li>Proficiency in Taal – Pehchan.</li> <li>Viva</li> </ol>
<b>Compulsory English Eng - 121</b>	<ol style="list-style-type: none"> <li>To enhance the critical thinking of the students with the help of poetry and essays.</li> <li>To read and appreciate the beauty of stories on their own.</li> <li>To teach them the intricacies of grammar so that they can make sentences on their own without any grammatical errors.</li> <li>Enable them to understand the difference between formal and informal communication with the help of letter writing.</li> <li>To enlighten and aware students about the literary characteristics of various poetic forms.</li> </ol>
<b>Lazmi Punjabi Pbi- 124</b>	<ol style="list-style-type: none"> <li>ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸ.ਸ. ਮੀਸ਼ਾ, ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ, ਰਵਿੰਦਰ ਰਵੀ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼, ਹਰਿਭਜਨ ਹਲਵਾਰਵੀ, ਮਨਜੀਤ ਟਿਵਾਣਾ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸ਼ਹੀਦ, ਜਿਊਣ ਜੋਗੇ, ਮੂਨ ਦੀ ਅੱਖ, ਇੱਕੀਵੀਂ ਸਦੀ, ਬਠਲੂ ਚਮਿਆਰ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ, ਡੁੰਮ) ਦੇ ਸੰਦਰਭ ਵਿਚ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>ਗੁਰਮੁਖੀ ਲਿਪੀ: ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸੰਬੰਧ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>ਵਿਆਕਰਨਿਕ ਸ਼੍ਰੇਣੀਆਂ: ਲੋੜ, ਮਹੱਤਵ ਅਤੇ ਮੁੱਖ ਸੰਕਲਪ - ਵਚਨ, ਲਿੰਗ, ਪੁਰਖ, ਕਾਲ, ਕਾਰਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> </ol>
	<b>Semester 3</b>
<b>Course Outcome MMI – 201 Music Instrumental (major theory -3)</b>	<ol style="list-style-type: none"> <li>Acquire the knowledge of origin &amp; development of student's own instrument</li> <li>Acquire the knowledge of Shri Guru Granth Sahib Ji.</li> <li>Being aware of Identification of Ragas.</li> <li>Acquire the knowledge of comparative study to their Samprakritik Ragas.</li> </ol>

<b>Course Outcome MMI – 202 Music Instrumental (major practical -3)</b>	<ol style="list-style-type: none"> <li>1. The student will be able to know the grammatical aspects of the prescribed Ragas, like how they arise.</li> <li>2. Student will gain of how to play Jhala in the prescribed Ragas.</li> </ol>
<b>Tabla (Minor) MTB - 203</b>	<ol style="list-style-type: none"> <li>7. Revision of 1<sup>st</sup> and 2<sup>nd</sup> semester syllabus (Practical Portion).</li> <li>8. Ability to demonstrate EKtaal, Jhaptaal, Pauritaal and Deepchandi on hand as well as Tabla (in than &amp; dugun layakaries) with description.</li> <li>9. Ability to play two prakars in each Talas.</li> <li>10. Ability to play Vilambit teentaal and Vilambit Ek Taal (in simple form).</li> <li>11. Ability to play 2 -2 laggies and tihais in Keherva and Dadra taal</li> <li>12. Viva</li> </ol>
<b>Compulsory English Eng - 201</b>	<ol style="list-style-type: none"> <li>11. To trace the development history of English Literature.</li> <li>12. To interpret the text from contemporary point of view.</li> <li>13. To critically analysis these text as a source of wisdom.</li> <li>14. To provide them knowledge of English Grammar as, types of clause, translation, complex and compound sentences.</li> <li>15. To develop critical thinking and imagination through long and short stories, poems and drama.</li> </ol>
<b>Lazmi Punjabi Pbi- 214</b>	<ol style="list-style-type: none"> <li>11. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ+ਗੁਰੂ ਸਾਹਿਬਾਨਾਂ ਦੀ ਬਾਣੀ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>12. ਇੱਕ ਐਤਵਾਰ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਨਵਾਂ ਚਾਨਣ, ਡਾਕਟਰ ਪਲਟਾ) ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> <li>13. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤਮਾਨ ਹਾਲਤ (ਸਾਹਿਤ, ਮੀਡੀਆ ਅਤੇ ਵਿੱਦਿਅਕ ਅਦਾਰਿਆਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ)</li> <li>14. ਧੁਨੀ ਵਿਗਿਆਨ ਅਤੇ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਵਰਗੀਕਰਨ ਅਤੇ ਅੰਤਰ-ਨਿਖੇੜ। ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ : ਖੰਡੀ ਅਤੇ ਅਖੰਡੀ ਧੁਨੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</li> <li>15. ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ ਲੇਖਣ ਦਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</li> </ol>
	<b>Semester 4</b>
<b>Course Outcome MMI – 221 Music Instrumental (major theory -4)</b>	<ol style="list-style-type: none"> <li>1. Aquire the knowledge of music from Medieval period to present time.</li> <li>2. The student will be able to know Importance of laya &amp; taal in music.</li> </ol>

	3. Being aware of proficiency in Raag Pelelaan by different swar-smooth. 4. The student will know the technique of proper handling of own instrument.
<b>Course Outcome MMI – 222 Music Instrumental (major practical -4)</b>	1. Able to play the composition in drut laya. 2. The student will learn Dheem in phari & Khamaj Raag. 3. Acquire the knowledge of Ada chau taal & Teevra taal by Rana in (than4 Dugun layakari) with description.
<b>Tabla (Minor) - 4 MTB 223</b>	6. Revision of 3 <sup>rd</sup> Semester Syllabus. 7. Ability to play Tivra Taal (in thah and dugun laykaries). 8. Ability to play one Kaida, four paltas and one tihai in Teentaal . 9. Proficiency in Taal Pehchan. 10. Viva
<b>Compulsory English ENG - 221</b>	7. To equip them to attempt practical criticism of plays, passages and poems To read and appreciate stories on their own. 8. To develop a comparative perspective to study the texts 9. To recognise and discuss the aspects of an author.
<b>Lazmi Punjabi PBI – 224</b>	11. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਸੂਫੀ ਕਾਵਿ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ (ਸ਼ਾਹ ਹੁਸੈਨ ਦੀਆਂ ਕਾਫ਼ੀਆਂ+ਹੀਰ ਦਮੋਦਰ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 12. ਪਾਠ-ਪੁਸਤਕ - ਮੰਚ ਦਰਸ਼ਨ ਵਿਚੋਂ ਅਗਲੀਆਂ ਪੰਜ ਇਕਾਂਗੀਆਂ ( ਗਊਮੁਖਾ-ਸ਼ੇਰਮੁਖਾ, ਜ਼ੈਲਦਾਰ, ਇਕ ਵਿਚਾਰੀ ਮਾਂ, ਅੰਨ੍ਹੇ ਨਿਸ਼ਾਨਚੀ, ਚਾਬੀਆਂ) ਦੇ ਆਧਾਰ 'ਤੇ ਪੰਜਾਬੀ ਇਕਾਂਗੀ ਬਾਰੇ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ। 13. ਸ਼ਬਦ ਵਿਗਿਆਨ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਅਤੇ ਰਚਨਾ; ਪੰਜਾਬੀ ਭਾਵੰਸ਼ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ। 14. ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਅਤੇ ਸਮੱਸਿਆਵਾਂ। 15. ਇਸ਼ਤਿਹਾਰ, ਪ੍ਰੈੱਸ ਨੋਟ ਅਤੇ ਖ਼ਬਰਾਂ : ਲਿਖਣ ਦੀਆਂ ਵਿਧੀਆਂ ਅਤੇ ਨੇਮਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
	<b>Semester 5</b>
<b>Course Outcome MMI – 301 Music Instrumental (major theory -5)</b>	1. The student will come to know about the time theory of Ragas its importance in contemporary music scene with particular study of the following: (a) Adhav darshak swar (b) Seasonal Ragas etc. 2. The student will gain knowledge of power of music.

	<p>3. They gain knowledge of the prescribed Raagas with Notation and in comparison to their samprkritik Raagas.</p> <p>The students will know about the life and contribution of legends how their works have shaped the present Hindustani music.</p>
<b>Course Outcome MMI – 302 Music Instrumental (major practical -5)</b>	<p>1. The student will gain self – belief alaw Meend in a Raagas, after practising its finer details.</p> <p>2. He will be able to play a Dhun with in depth knowledge of its style of performance.</p>
<b>Tabla (Minor) -5 MTB 303</b>	<p>7. Ability to play chartaal and Sooltaal.</p> <p>8. Ability to play 2 Chakkardar Param in Teentaal and Japhtaal</p> <p>9. Ability to play Uthaa of teentaal and Chartaal.</p> <p>10. 2 Laggies, Ladi and Tihaies in Keherwa and Dadra taal.</p> <p>11. Proficiency in Taal- Pehchan.</p> <p>12. Viva</p>
<b>Compulsory English Eng - 301</b>	<p>9. Enable students to understand various kinds of business communication tactics and to use them in professional sphere.</p> <p>10. Make students able to read and understand poetry by enhancing their critical ability.</p> <p>11. Make them able to inculcate habits of pleasurable reading with the help of novel reading.</p> <p>12. To learn to use grammar correctly.</p>
<b>Lazmi Punjabi Pbi- 314</b>	<p>11. ਨਾਵਲ : ਸੁੰਦਰੀ ( ਭਾਈ ਵੀਰ ਸਿੰਘ) ਦਾ ਪਾਠਗਤ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ ਕਰਵਾਉਣਾ।</p> <p>12. ਪਾਠ-ਪੁਸਤਕ - ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਵਿਚਲੇ ਲੇਖਾਂ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ।</p> <p>13. ਵਾਕ-ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ; ਰੂਪ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਾਕ ਵੰਡ- ਸਧਾਰਨ, ਸੰਯੁਕਤ, ਮਿਸ਼ਰਤ। ਕਾਰਜ ਦੇ ਆਧਾਰ ਤੇ ਵਾਕ ਵੰਡ- ਬਿਆਨੀਆ, ਸਵਾਲੀਆ ਅਤੇ ਹੁਕਮੀ ਵਾਕ।</p> <p>14. ਸੰਚਾਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸੰਚਾਰ ਸਾਧਨ: ਪ੍ਰਿੰਟ ਅਤੇ ਬਿਜਲਈ ਮੀਡੀਆ (ਅਖ਼ਬਾਰ, ਰਸਾਲੇ, ਰੇਡੀਓ, ਟੈਲੀਵਿਜ਼ਨ, ਕੰਪਿਊਟਰ ਅਤੇ ਇੰਟਰਨੈੱਟ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਲਈ ਯੋਗਦਾਨ)</p> <p>15. ਕਿਸੇ ਅਣਡਿੱਠੇ ਪੈਰੇ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਅਤੇ ਸੰਖੇਪ-ਰਚਨਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</p>

<b>Value Education, Ethics &amp; Human Rights GSES -301</b>	<ul style="list-style-type: none"> <li>7. Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being.</li> <li>8. To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order</li> <li>9. To learn about Professional ethics and issues in professional ethics.</li> </ul>
	<b>Semester 6</b>
<b>Course Outcome MMI – 321 (Music Instrumental (major theory -5)</b>	<ul style="list-style-type: none"> <li>1. The student will be able to know the scientific analysis of the principal of music.</li> <li>2. The students learn the description of the taals with various layakaries in Notation.</li> <li>3. Students learn and able to write the Notation of prescribed Raagas.</li> </ul>
<b>Course Outcome MMI – 322 (Music Instrumental (major practical -6)</b>	<ul style="list-style-type: none"> <li>1. Students will develop the ability to demonstration a few techniques of own Instrument.</li> <li>2. The student will develop the confidence to perform of raga for a long duration of time.</li> <li>3. The student will develop the confidence to differentiate between similar Ragas.</li> </ul>
<b>Tabla Minor -6 MTB 323</b>	<ul style="list-style-type: none"> <li>7. Revision of all the previous semester's syllabus.</li> <li>8. Ability to play 2 Laggi, Ladi and Tihai in Keherwa, Dadra Roopak and Deepchandi taal.</li> <li>9. Proficiency in Taal- Pehchan.</li> <li>10. Solo performance in Teentaal (Duration 10 minutes) 2 Uthaan, 2 Kaidas with 6 Paltas, 2 Tihais Mukhda and Mohra etc</li> <li>11. Knowledge of Theka of National Anthem.</li> <li>12. Viva</li> </ul>
<b>Compulsory English Eng - 321</b>	<ul style="list-style-type: none"> <li>11. To explore different genres and inculcate critical powers by looking at their meticulous details.</li> <li>12. To analyse various types of genres ranging from poetry to drama with reference to thematic and other approaches.</li> <li>13. Enable students to have a peep into the phonetic system of English language by using intonation and stress pattern.</li> <li>14. To teach syllable structure and syllable division by focusing on mono and disyllabic words.</li> <li>15. To teach them to use grammar correctly.</li> </ul>
<b>Lazmi Punjabi Pbi- 324</b>	<ul style="list-style-type: none"> <li>11. ਪਾਠ-ਪੁਸਤਕ - ਯਾਦਾਂ ਦੀ ਕੰਨੀ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਰਤਕ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</li> </ul>

	<p>12. ਪਾਠ-ਪੁਸਤਕ - ਵਾਰਤਕ ਵਿਵੇਕ ਦੇ ਆਧਾਰ 'ਤੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਵਿਸ਼ਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>13. ਭਾਸ਼ਾ-ਵਿਗਿਆਨਕ ਸ਼ਬਦਾਵਲੀ: ਦੁਭਾਸ਼ਾਵਾਦ, ਬਹੁਭਾਸ਼ਾਵਾਦ, ਮਾਂ-ਬੋਲੀ, ਦੂਜੀ ਭਾਸ਼ਾ, ਸਰਕਾਰੀ ਭਾਸ਼ਾ।</p> <p>14. ਅਰਥ-ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੋੜ, ਅਰਥ ਵਿਸਤਾਰ ਅਤੇ ਸੰਕੋਚ, ਅਰਥ ਉਤਰਾਅ ਅਤੇ ਚੜ੍ਹਾਅ</p> <p>15. ਪੈਰਾ ਅਨੁਵਾਦ : ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ (ਪੈਰਾ ਲਗਭਗ 100-125 ਸ਼ਬਦਾਂ ਦਾ ਹੋਵੇ)ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</p>
<b>Environmental Studies</b> <b>GSES -321</b>	<p>11. To understand the need for public awareness for environment.</p> <p>12. To learn about renewable and non-renewable resources, problems associated with Natural resources.</p> <p>13. To know about ecosystems, structure and function of an ecosystem.</p> <p>14. Understand biodiversity and impact on environment, conservations of bio resources.</p> <p>15. Environmental pollution and causes and remedies.</p>



<b>Program Outcomes, Program Specific Outcomes &amp; Course Outcomes of B.A. Humanities</b>	
<b>Program Outcomes</b>	<b>Outcomes</b>
<b>PO1.</b>	The students acquire knowledge in the field of social sciences, literature and humanities which make them sensitive and sensible enough.
<b>PO2.</b>	The B.A. graduates will be acquainted with the social, economic, historical, geographical, political, ideological and philosophical tradition and thinking.
<b>PO3.</b>	The program also empowers the graduates to appear for various competitive examinations or choose the post graduate programme of their choice.
<b>PO4.</b>	The B. A. program enables the students to acquire the knowledge with human values framing the base to deal with various problems in life with courage and humanity
<b>PO5.</b>	The students will be ignited enough to think and act over for the solution of various issues prevailing in the human life to make this world better than ever.
<b>PO6.</b>	Programme provides the base to be the responsible citizen.
<b>PO7.</b>	ਪੰਜਾਬੀ ਭਾਸ਼ਾ, ਸਾਹਿਤ ਅਤੇ ਸਭਿਆਚਾਰ ਬਾਰੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਮੁੱਢਲੀ ਸਮਝ ਪੈਦਾ ਕਰਨੀ।
<b>Program Specific Outcomes</b>	<b>Outcomes</b>
<b>PSO1.</b>	Fine arts contribute to the gradual civilization of man by activating his sense perceptions sharply so as to be quick enough to react to their appeal.
<b>PSO2.</b>	They will be confident at Listening (comprehending), speaking, reading and writing skills.
<b>PSO3.</b>	Students will demonstrate oral communication skills needed to participate in a conversation that builds knowledge collaboratively: listening carefully and respectfully to others' viewpoints; articulating their own ideas and questions clearly; and situating their own ideas while facing real life problems.
<b>PSO4.</b>	Students will be able to increase confidence in speaking publicly. Students will be able to prepare, organize, and deliver an engaging oral presentation.
<b>PSO5.</b>	Students will be able to write effectively for a variety of professional and social settings. They will practice writing as a process of motivated inquiry.
<b>PSO6.</b>	They will demonstrate an ability to revise for content and edit for grammatical and stylistic clarity. And they will develop an awareness of and confidence in their own voice as a writer
<b>PSO7.</b>	1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਵਿਚਲੇ ਪ੍ਰਮੁੱਖ ਕਵੀਆਂ ਦੀ ਕਵਿਤਾ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ।
<b>PSO8.</b>	ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਹਾਣੀ ਬਾਰੇ ਪ੍ਰਮੁੱਖ ਕਹਾਣੀਕਾਰਾਂ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।
<b>PSO9.</b>	ਵਿਆਕਰਣ ਵਿਚਲੀਆਂ ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਪੈਦਾ ਕਰਨੀ।
<b>PSO10.</b>	ਮੱਧਕਾਲੀ ਪੰਜਾਬੀ ਕਵਿਤਾ ਵਿਚਲੇ ਗੁਰਮਤਿ ਕਾਵਿ, ਕਿੱਸਾ ਕਾਵਿ, ਸੂਫੀ ਕਾਵਿ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>PSO11.</b>	ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਬਾਰੇ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>PSO12.</b>	ਪੰਜਾਬੀ ਨਾਵਲ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।
<b>PSO13.</b>	ਆਧੁਨਿਕ ਵਾਰਤਕ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>Course Outcomes</b>	<b>Outcomes BA (Hum.) Sem. I</b>
<b>Compulsory English-I (Introduction) ENG-116</b>	CO I: To know and appreciate the location of literature within humanities CO II: To establish connections across frontiers of disciplines CO III: To become acquainted with grammar and representation. CO IV: To develop critical thinking in students

	CO V: To know the process of beginning and growth of English language
<b>Functional English-I ENG 117</b>	CO I: To appreciate, interpret and critically evaluate literature. CO II: To form an idea about the various stages in the development of English language. CO III: To speak and write choosing from a wider range of vocabulary CO IV: To refer to the dictionary for meaning, usage and grammar CO V: To become proficient in English for global competency
<b>ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ (PBI-114)</b>	CO1. ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਭਾਈ ਵੀਰ ਸਿੰਘ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਕ, ਪੂਰਨ ਸਿੰਘ, ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਫੀਰ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਹਰਿਭਜਨ ਸਿੰਘ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। CO2. ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸਤਾਈ ਜਨਵਰੀ, ਮੁੜ ਵਿਧਵਾ, ਪਠਾਣ ਦੀ ਧੀ, ਤ੍ਰਿਸ਼ਨਾ, ਭੇਤ ਵਾਲੀ ਗੱਲ, ਧਰਤੀ ਹੇਠਲਾ ਬੈਲਦ, ਇਕ ਬਾਲੜੀ ਦੇ ਪਤਾਸੇ, ਮੋਹੜੀ) ਦੇ ਸੰਦਰਭ CO3. ਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ, ਉਪਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ-ਸੰਬੰਧ, ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਈ ਵੰਨਗੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। CO4. ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ-ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ, ਵਿਸਮਿਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>ਸਾਹਿਤ ਸਿਧਾਂਤ, ਆਲੋਚਨਾ ਅਤੇ ਇਤਿਹਾਸਕਾਰੀ (PBI-115)</b>	CO1. ਸਾਹਿਤ: ਪਰਿਭਾਸ਼ਾ, ਤੱਤ ਤੇ ਉਦੇਸ਼, ਸਾਹਿਤ ਦਾ ਸਮਾਜ, ਸਭਿਆਚਾਰ ਅਤੇ ਧਰਮ ਨਾਲ ਅੰਤਰ-ਸੰਬੰਧ। CO2. ਭਾਰਤੀ ਕਾਵਿ-ਸ਼ਾਸਤਰ: ਰਸ, ਧੁਨੀ ਅਤੇ ਅਲੰਕਾਰ। CO3. ਛੰਦ-ਸ਼ਾਸਤਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਸਰੂਪ, ਛੰਦਾਂ ਬਾਰੇ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਕ ਜਾਣਕਾਰੀ (ਦੋਹਿਰਾ, ਬੈਂਤ, ਕੋਰੜਾ, ਕਬਿੱਤ, ਸੋਰਠਾ, ਦਵੱਈਆ)। CO4. ਸਾਹਿਤ ਇਤਿਹਾਸਕਾਰੀ: ਪਰਿਭਾਸ਼ਾ, ਲੋੜ ਅਤੇ ਸਰੂਪ, ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਇਤਿਹਾਸਕਾਰੀ ਬਾਰੇ ਸੰਖੇਪ ਜਾਣਕਾਰੀ। CO5. ਸਾਹਿਤ ਆਲੋਚਨਾ: ਸਿਧਾਂਤਕ ਜਾਣ-ਪਛਾਣ, ਮੁੱਢਲੇ ਪੰਜਾਬੀ ਆਲੋਚਕ: ਬਾਵਾ ਬੁੱਧ ਸਿੰਘ ਅਤੇ ਮੌਲਾ ਬਖਸ਼ ਕੁਸ਼ਤਾ ਦੁਆਰਾ ਪੰਜਾਬੀ ਆਲੋਚਨਾ ਦੇ ਖੇਤਰ ਵਿਚ ਯੋਗਦਾਨ। CO6. ਵਿਹਾਰਕ ਆਲੋਚਨਾ: ਪਰਿਭਾਸ਼ਾ, ਸਰੂਪ, ਨੇਮ ਅਤੇ ਅਭਿਆਸ।
<b>HND-101</b>	CO1: Understand about basic Basics of Samanya Bhasha Vigyan and Hindi Bhasha

	CO2: To know the Hindi Bhasha ka Uday avam Vikas CO3: To know about Adikal, Madhyakal avam Adhunik Kal
<b>Course Outcomes</b>	<b>Outcomes BA (Hum.) Sem. II</b>
<b>Compulsory English-II (A Step Ahead) ENG-126</b>	CO I: To enhance their close reading skill. CO II: To develop the sensitivity of language. CO III: To strengthen the aesthetic sense CO IV: To enhance LSRW communicative skills through language and literature CO V: To improve vocabulary and develop the writing skills
<b>Functional English-II ENG 127</b>	CO I: To know about various innovative ways of using English language in verbal and non-Verbal communications. -verbal communications. CO II: To boost up critical thinking and writing CO III: To offer a platform to express creativity and talent CO IV: To develop global competencies for successful life CO V: To cultivate a value - added life to face challenges and achieve excellence
<b>ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ (PBI-124)</b>	CO1. ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸ.ਸ. ਮੀਸ਼ਾ, ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ, ਰਵਿੰਦਰ ਰਵੀ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼, ਹਰਿਭਜਨ ਹਲਵਾਰਵੀ, ਮਨਜੀਤ ਟਿਵਾਣਾ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। CO2. ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸ਼ਹੀਦ, ਜਿਊਣ ਜੇਗੇ, ਮੂਨ ਦੀ ਅੱਖ, ਇੱਕੀਵੀਂ ਸਦੀ, ਬਠਲੂ ਚਮਿਆਰ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ, ਡੁੰਮ) ਦੇ ਸੰਦਰਭ ਵਿਚ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। CO 3. ਗੁਰਮੁਖੀ ਲਿਪੀ: ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸੰਬੰਧ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। CO 4. ਵਿਆਕਰਨਿਕ ਸ਼੍ਰੇਣੀਆਂ: ਲੇੜ, ਮਹੱਤਵ ਅਤੇ ਮੁੱਖ ਸੰਕਲਪ - ਵਚਨ, ਲਿੰਗ, ਪੁਰਖ, ਕਾਲ, ਕਾਰਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
<b>ਪੰਜਾਬੀ ਮੱਧਕਾਲੀ-ਕਾਵਿ (PBI-125)</b>	CO 1. ਪੰਜਾਬੀ ਮੱਧਕਾਲੀ ਕਾਵਿ-ਧਾਰਾਵਾਂ (ਗੁਰਮਤਿ, ਸੂਫੀ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ) ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣ-ਪਛਾਣ। CO 2. ਮੱਧਕਾਲੀ ਕਾਵਿ-ਰੂਪਾਕਾਰ: ਸਲੋਕ, ਪਦਾ, ਬਾਰਾਂਮਾਹ, ਕਾਫ਼ੀ ਅਤੇ ਕਿੱਸਾ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ। CO 3. ਪਾਠ-ਪੁਸਤਕ - ਜਪੁਜੀ ਸਾਹਿਬ (ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ) : ਵਿਸ਼ਾਗਤ, ਸਿਧਾਂਤਕ ਅਤੇ ਰੂਪਾਕਾਰਕ ਅਧਿਐਨ। CO 4. ਪਾਠ-ਪੁਸਤਕ - ਕਲਾਮ ਬੁੱਲ੍ਹੇ ਸ਼ਾਹ ਵਿਚੋਂ 30 ਕਾਫ਼ੀਆਂ : ਵਿਸ਼ਾਗਤ, ਸਿਧਾਂਤਕ ਅਤੇ ਰੂਪਾਕਾਰਕ ਅਧਿਐਨ।

	CO 5. ਪਾਠ-ਪੁਸਤਕ - ਸੱਸੀ ਪੁੰਨੂੰ (ਹਾਸਮ ਸ਼ਾਹ) : ਵਿਸ਼ਾਗਤ, ਸਿਧਾਂਤਕ ਅਤੇ ਰੂਪਾਕਾਰਕ ਅਧਿਐਨ।
<b>Course Outcomes</b>	<b>Outcomes BA (Hum.) Sem. III</b>
<b>Compulsory English-III (Poetry) ENG-216</b>	CO I: To distinguish between the different varieties of English used all over the world CO II: To enable them to compose and appreciate different types of poetry CO III: To introduce the students to the basic elements of poetry- to enrich the student through various perspectives readings in poetry CO IV: To analyze poetic texts using appropriate terms such as diction, tone, imagery, figures of speech, motif, etc. CO V: To identify and account for distinct literary characteristics of various poetic forms.
<b>Functional English-III ENG 217</b>	CO I: To become able to differentiate between judgment and appreciation CO II: To interact confidently in situations like debates and group discussions and seminars CO III: To exercise dramatic and life skills CO IV: To kindle creative mind with innovative thoughts CO V: To know the beauty of the coherence of Language and Literature
<b>ਲਾਜ਼ਮੀ ਪੰਜਾਬੀ (PBI-214)</b>	1. ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿੱਚੋਂ ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ+ਗੁਰੂ ਸਾਹਿਬਾਨਾਂ ਦੀ ਬਾਣੀ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 2. ਇੱਕ ਐਤਵਾਰ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਨਵਾਂ ਚਾਨਣ, ਡਾਕਟਰ ਪਲਟਾ) ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ। 3. ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤਮਾਨ ਹਾਲਤ (ਸਾਹਿਤ, ਮੀਡੀਆ ਅਤੇ ਵਿੱਦਿਅਕ ਅਦਾਰਿਆਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ) 4. ਧੁਨੀ ਵਿਗਿਆਨ ਅਤੇ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਵਰਗੀਕਰਨ ਅਤੇ ਅੰਤਰ-ਨਿਖੇੜ। ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ : ਖੰਡੀ ਅਤੇ ਅਖੰਡੀ ਧੁਨੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ। 5. ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ ਲੇਖਣ ਦਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।
<b>ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ (PBI-215)</b>	1. ਪੰਜਾਬੀ ਨਾਟ- ਰੂਪਾਕਾਰਾਂ ਬਾਰੇ ਜਾਣ-ਪਛਾਣ। 2. ਲੋਕ-ਨਾਟ ਪਰੰਪਰਾ ਬਾਰੇ ਸੰਖੇਪ ਜਾਣਕਾਰੀ। 3. ਪਾਠ ਪੁਸਤਕ : 1960 ਤੋਂ ਪਿਛੋਂ ਦੇ ਇਕਾਂਗੀ ਦਾ ਵਿਸ਼ਾਗਤ ਅਤੇ ਕਲਾਮਈ ਅਧਿਐਨ। 4. ਪਾਠ ਪੁਸਤਕ : ਬਗਾਨੇ ਬੋਹੜ ਦੀ ਛਾਂ ਦਾ ਵਿਸ਼ਾਗਤ ਅਤੇ ਕਲਾਤਮਕ ਅਧਿਐਨ। 5. ਪਾਠ ਪੁਸਤਕ : ਮੁਇਆਂ ਸਾਰ ਨ ਕਾਈ ਦਾ ਵਿਸ਼ਾਗਤ ਅਤੇ ਕਲਾਤਮਿਕ ਅਧਿਐਨ।
<b>Course Outcomes</b>	<b>Outcomes BA (Hum.) Sem. IV</b>
<b>Compulsory English-IV (Short Stories) ENG 226</b>	CO I: To equip them to attempt practical criticism of plays, passages and poems CO II: To read and appreciate stories on their own. CO III: To develop a comparative perspective to study the texts CO IV: To recognise and discuss the aspects of an author. CO V: To demonstrate an awareness of cultural and intercultural concerns relating to that author.
<b>Functional English-IV ENG 227</b>	CO I: To lead to a greater understanding of the human communicative action through an objective study of language

	<p>CO II: To familiarize students with the key concepts of English and develop awareness of the latest trends in language study</p> <p>CO III: To help students move towards better and intelligible pronunciation and to improve the general standard of pronunciation in everyday conversation.</p> <p>CO IV: To demonstrate the awareness of evolution theory of language by varied culture</p> <p>CO V: To study the formation of new words</p>
<b>Punjabi Lazmi (PBI-224)</b>	<p>CO I: ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿਚੋਂ ਸੂਫੀ ਕਾਵਿ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ (ਸ਼ਾਹ ਹੁਸੈਨ ਦੀਆਂ ਕਾਫ਼ੀਆਂ+ਹੀਰ ਦਮੋਦਰ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>CO II: ਪਾਠ-ਪੁਸਤਕ - ਮੰਚ ਦਰਸ਼ਨ ਵਿਚੋਂ ਅਗਲੀਆਂ ਪੰਜ ਇਕਾਂਗੀਆਂ ( ਗਊਮੁਖਾ-ਸ਼ੇਰਮੁਖਾ, ਜੈਲਦਾਰ, ਇਕ ਵਿਚਾਰੀ ਮਾਂ, ਅੰਨ੍ਹੇ ਨਿਸ਼ਾਨਚੀ, ਚਾਬੀਆਂ) ਦੇ ਆਧਾਰ 'ਤੇ ਪੰਜਾਬੀ ਇਕਾਂਗੀ ਬਾਰੇ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</p> <p>CO III: ਸ਼ਬਦ ਵਿਗਿਆਨ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਅਤੇ ਰਚਨਾ; ਪੰਜਾਬੀ ਭਾਵੇਂਸ਼ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ।</p> <p>CO IV: ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਅਤੇ ਸਮੱਸਿਆਵਾਂ।</p> <p>CO V: ਇਸ਼ਤਿਹਾਰ, ਪ੍ਰੈੱਸ ਨੋਟ ਅਤੇ ਖ਼ਬਰਾਂ : ਲਿਖਣ ਦੀਆਂ ਵਿਧੀਆਂ ਅਤੇ ਨੇਮਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<b>ਪੰਜਾਬੀ ਗਲਪ (PBI-225)</b>	<ol style="list-style-type: none"> <li>1. ਸਾਹਿਤ ਰੂਪਾਕਾਰ : ਨਾਵਲ ਤੇ ਕਹਾਣੀ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣ-ਪਛਾਣ।</li> <li>2. ਪੰਜਾਬੀ ਗਲਪ ਦੇ ਇਤਿਹਾਸ ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ।</li> <li>3. ਪਾਠ ਪੁਸਤਕ - ਦੁਆਦਸ਼ੀ ਵਿਚਲੀਆਂ ਕਹਾਣੀਆਂ ਦਾ ਥੀਮਕ ਅਤੇ ਕਲਾਤਮਕ ਅਧਿਐਨ।</li> <li>4. ਪਾਠ ਪੁਸਤਕ - ਕਥਾ-ਸੰਸਾਰ (1960 ਤੋਂ ਪਿੱਛੋਂ ਦੀ ਪੰਜਾਬੀ ਕਹਾਣੀ ਦਾ ਸੰਗ੍ਰਹਿ) ਦਾ ਵਿਸ਼ਾਗਤ ਅਤੇ ਕਲਾਤਮਕ ਅਧਿਐਨ।</li> <li>5. ਪਾਠ-ਪੁਸਤਕ - ਬਾਬਾ ਤੇਗ਼ਾ ਸਿੰਘ (ਨਾਵਲ) ਦਾ ਥੀਮਕ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ।</li> </ol>
<b>Course Outcomes</b>	<b>Outcomes BA (Hum.) Sem. V</b>
<b>Compulsory English-V (Studies in Drama) ENG 316</b>	<p>CO I: On completion of the course, the students should be familiar with the plays of master- dramatists and will have developed the ability to appreciate and evaluate various types of plays</p> <p>CO II: To identify the distinct literary genres of the tragedies, comedies, and histories present in plays</p> <p>CO III: To enact the scenes without hesitation.</p> <p>CO IV: To identify the main ideas, details and speakers' attitudes and emotions by listening to different types of spoken texts.</p> <p>CO V: To speak intelligibly (pronunciation, stress, intonation)</p>
<b>Punjabi Lazmi (PBI-314)</b>	<p>CO I: ਨਾਵਲ : ਮੁੰਦਰੀ ( ਭਾਈ ਵੀਰ ਸਿੰਘ) ਦਾ ਪਾਠਗਤ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ ਕਰਵਾਉਣਾ।</p> <p>CO II: ਪਾਠ-ਪੁਸਤਕ - ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਵਿਚਲੇ ਲੇਖਾਂ ਦੇ ਆਧਾਰ 'ਤੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ।</p> <p>CO III: ਵਾਕ-ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ; ਰੂਪ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਕ ਵੰਡ- ਸਧਾਰਨ, ਸੰਯੁਕਤ, ਮਿਸ਼ਰਤ। ਕਾਰਜ ਦੇ ਆਧਾਰ ਤੇ ਵਾਕ ਵੰਡ- ਬਿਆਨੀਆ, ਸਵਾਲੀਆ ਅਤੇ ਹੁਕਮੀ ਵਾਕ।</p>

	<p>CO IV:ਸੰਚਾਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸੰਚਾਰ ਸਾਧਨ: ਪ੍ਰਿੰਟ ਅਤੇ ਬਿਜਲਈ ਮੀਡੀਆ (ਅਖ਼ਬਾਰ, ਰਸਾਲੇ, ਰੇਡੀਓ, ਟੈਲੀਵਿਜ਼ਨ, ਕੰਪਿਊਟਰ ਅਤੇ ਇੰਟਰਨੈੱਟ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਲਈ ਯੋਗਦਾਨ)</p> <p>CO V:ਕਿਸੇ ਅਣਡਿੱਠੇ ਪੈਰੇ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਅਤੇ ਸੰਖੇਪ-ਰਚਨਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</p>
<p><b>ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ (PBI-315)</b></p>	<ol style="list-style-type: none"> <li>1. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ-ਰੂਪਾਕਾਰ: ਜਾਣ-ਪਛਾਣ (ਰੁਬਾਈ, ਖੁੱਲ੍ਹੀ ਕਵਿਤਾ, ਗੀਤ, ਗ਼ਜ਼ਲ)</li> <li>2. ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ ਦੇ ਮੁੱਖ ਰੁਝਾਨਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ।</li> <li>3. ਪਾਠ ਪੁਸਤਕ : ਸੁਖਨ ਦੇ ਸੂਰਜ</li> <li>4. ਪਾਠ ਪੁਸਤਕ : ਕਾਵਿ-ਜੋਤਿ</li> <li>5. ਪਾਠ ਪੁਸਤਕ : ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਕਵਿਤਾ</li> </ol>
<p><b>ਪੰਜਾਬੀ ਵਾਰਤਕ (PBI-316)</b></p>	<ol style="list-style-type: none"> <li>1. ਵਾਰਤਕ ਰੂਪਾਕਾਰਾਂ ਸਾਖੀ, ਸਵੈ-ਜੀਵਨੀ, ਨਿਬੰਧ ਅਤੇ ਸਫ਼ਰਨਾਮਾ ਬਾਰੇ ਜਾਣਕਾਰੀ।</li> <li>2. ਪਾਠ-ਪੁਸਤਕ : ਪੁਰਾਤਨ ਜਨਮ ਸਾਖੀ ਵਿਚੋਂ ਚਾਰ ਉਦਾਸੀਆਂ (ਸੰਪਾ. ਭਾਈ ਵੀਰ ਸਿੰਘ)</li> <li>3. ਪਾਠ-ਪੁਸਤਕ : ਪੰਜਾਬੀ ਵਾਰਤਕੀ</li> <li>4. ਪਾਠ-ਪੁਸਤਕ : ਖੁੱਲ੍ਹੇ ਲੇਖ</li> </ol>
<p><b>ਪੰਜਾਬੀ ਅਤੇ ਸਮਾਜਕੀ ਵਿਗਿਆਨ (PBI-317)</b></p>	<ol style="list-style-type: none"> <li>1. ਭਾਸ਼ਾ ਦੀ ਪ੍ਰਕਿਰਤੀ, ਵਿਕਾਸ, ਮਹੱਤਤਾ ਅਤੇ ਲੋੜ</li> <li>2. ਭਾਸ਼ਾ ਦਾ ਧਰਮ, ਇਤਿਹਾਸ, ਸਭਿਆਚਾਰ ਅਤੇ ਮਨੋਵਿਗਿਆਨ ਨਾਲ ਸਬੰਧ</li> <li>3. ਸਮਾਜੀ ਭਾਸ਼ਾ ਵਿਗਿਆਨ, ਪੰਜਾਬੀ ਉਪਭਾਸ਼ਾਵਾਂ ਦੇ ਪਛਾਣ-ਚਿੰਨ੍ਹ</li> <li>4. ਮਾਂ-ਬੋਲੀ ਦਾ ਮਹੱਤਵ, ਰਾਜ ਭਾਸ਼ਾ ਅਤੇ ਕੌਮੀ ਭਾਸ਼ਾ</li> <li>5. ਭਾਸ਼ਾ ਅਤੇ ਸਿੱਖਿਆ ਪ੍ਰਬੰਧ, ਬੱਚੇ ਦਾ ਮਾਨਸਿਕ ਵਿਕਾਸ ਅਤੇ ਭਾਸ਼ਾ, ਬੱਚੇ ਦਾ ਸਮਾਜੀਕਰਣ</li> <li>6. ਭਾਸ਼ਾ, ਨਸਲ ਅਤੇ ਕੌਮੀਅਤ</li> </ol>
<p><b>Course Outcomes</b></p>	<p><b>Outcomes BA (Hum.) Sem.VI</b></p>
<p><b>Compulsory English- VI (Introduction to Fiction and Non-Fiction)</b> <b>ENG 326</b></p>	<p>CO I: To develop critical thinking and imagination through long and short fiction and to familiarize students with cultural diversity through different representative samples of fiction</p> <p>CO II: To expose the different genres to acquire knowledge and apply that in the creative writing.</p> <p>CO III: To acquire a broad perspective of the novel as a literary genre and the relevant historical, geographical, and cultural identical backgrounds.</p> <p>CO IV: To analyze various types of novels with reference to thematic and other approaches</p> <p>CO V: Appreciate the working of various literary devices like irony in fiction</p>
<p><b>Punjabi Lazmi (PBI-324)</b></p>	<p>CO I: ਪਾਠ-ਪੁਸਤਕ - ਯਾਦਾਂ ਦੀ ਕੰਨੀ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਰਤਕ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।</p> <p>CO II: ਪਾਠ-ਪੁਸਤਕ - ਵਾਰਤਕ ਵਿਵੇਕ ਦੇ ਆਧਾਰ 'ਤੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਵਿਸ਼ਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p> <p>CO III: ਭਾਸ਼ਾ-ਵਿਗਿਆਨਕ ਸ਼ਬਦਾਵਲੀ: ਦੁਭਾਸ਼ਾਵਾਦ, ਬਹੁਭਾਸ਼ਾਵਾਦ, ਮਾਂ-ਬੋਲੀ, ਦੂਜੀ ਭਾਸ਼ਾ, ਸਰਕਾਰੀ ਭਾਸ਼ਾ।</p>



	<p>CO IV: ਅਰਥ-ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੋੜ, ਅਰਥ ਵਿਸਤਾਰ ਅਤੇ ਸੰਕੋਚ, ਅਰਥ ਉਤਰਾਅ ਅਤੇ ਚੜ੍ਹਾਅ</p> <p>CO V: ਪੈਰਾ ਅਨੁਵਾਦ: ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ (ਪੈਰਾ ਲਗਭਗ 100-125 ਸ਼ਬਦਾਂ ਦਾ ਹੋਵੇ)ਅਭਿਆਸ ਕਰਵਾਉਣਾ।</p>
<p><b>ਪੰਜਾਬੀ ਲੋਕਧਾਰਾ, ਭਾਸ਼ਾ ਅਤੇ ਸਭਿਆਚਾਰ (PBI-325)</b></p>	<ol style="list-style-type: none"> <li>1. ਲੋਕਧਾਰਾ : ਸਿਧਾਂਤਕ ਜਾਣ-ਪਛਾਣ</li> <li>2. ਪਾਠ ਪੁਸਤਕ : ਲੋਕਧਾਰਾ ਦੀ ਭੂਮਿਕਾ</li> <li>3. ਸਭਿਆਚਾਰ : ਸਿਧਾਂਤਕ ਜਾਣ-ਪਛਾਣ</li> <li>4. ਪਾਠ-ਪੁਸਤਕ : ਸਭਿਆਚਾਰ ਤੇ ਵਿਚਾਰ</li> <li>5. ਭਾਸ਼ਾ : ਪਰਿਭਾਸ਼ਾ, ਪ੍ਰਕਿਰਤੀ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ।</li> <li>6. ਭਾਸ਼ਾ ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ (ਧੁਨੀ ਵਿਗਿਆਨ, ਸ਼ਬਦ ਵਿਗਿਆਨ, ਵਾਕ ਵਿਗਿਆਨ, ਅਰਥ ਵਿਗਿਆਨ ਬਾਰੇ ਮੁੱਢਲੀ ਜਾਣਕਾਰੀ)</li> </ol>
<p><b>ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਅਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ (PBI-326)</b></p>	<ol style="list-style-type: none"> <li>1. ਪੰਜਾਬੀ ਵਿਆਕਰਣ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ</li> <li>2. ਗੁਰਬਾਣੀ ਵਿਆਕਰਣ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ</li> <li>3. ਪੰਜਾਬੀ ਵਿਚ ਨਵੇਂ ਭਾਸ਼ਾ ਵਿਗਿਆਨਕ ਸੰਕਲਪ : ਜਾਣ-ਪਛਾਣ</li> <li>4. ਪੰਜਾਬੀ ਦੀ ਧੁਨੀ ਵਿਉਂਤ ਅਤੇ ਸ਼ਬਦ ਵਿਉਂਤ</li> <li>5. ਪੰਜਾਬੀ ਦੀ ਵਾਕਸ਼ ਅਤੇ ਵਾਕ ਵਿਉਂਤ</li> <li>6. ਅਰਥ-ਵਿਗਿਆਨ ਅਤੇ ਪੰਜਾਬੀ ਅਰਥ ਵਿਉਂਤ</li> </ol>
<p><b>ਭਾਸ਼ਾਈ ਅਧਿਆਪਨ ਅਤੇ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਸਿਖਲਾਈ (PBI-327)</b></p>	<ol style="list-style-type: none"> <li>1. ਭਾਸ਼ਾ ਸਿੱਖਣ ਦੇ ਸਿਧਾਂਤ ਅਤੇ ਨਿਯਮ</li> <li>2. ਬੱਚੇ ਦੇ ਸਿੱਖਣ ਵਿਚ ਮਾਂ-ਬੋਲੀ ਦੀ ਭੂਮਿਕਾ</li> <li>3. ਦੂਜੀ ਬੋਲੀ ਸਿੱਖਣ ਦੇ ਸਿਧਾਂਤ ਅਤੇ ਨਿਯਮ</li> <li>4. ਪੰਜਾਬੀ ਅਧਿਆਪਨ ਦੇ ਟੀਚੇ ਅਤੇ ਉਦੇਸ਼</li> <li>5. ਭਾਸ਼ਾਈ ਗਤੀਵਿਧੀਆਂ : ਜਾਣ-ਪਛਾਣ ਕਰਨੀ, ਭਾਸ਼ਣ ਵਿਧੀ, ਬਹਿਸ ਵਿਧੀ, ਕਹਾਣੀ ਵਿਧੀ</li> <li>6. ਅਧਿਆਪਨ ਵਿਧੀਆਂ : ਪ੍ਰਾਜੈਕਟ ਵਿਧੀ, ਖੇਡ ਵਿਧੀ, ਵਿਚਾਰ-ਵਟਾਂਦਰਾ ਵਿਧੀ, ਪੜਚੋਲ ਵਿਧੀ</li> </ol>

## **Programme: B.LIB.I.SC (One Year degree programme)**

### **PROGRAMME OUTCOMES (POs)**

**PO1:** Understand about libraries and librarianship.

**PO 2:** Get acquainted with various standards and tools being used in processing, managing and retrieving information resources.

**PO 3:** Ability to manage information traditionally as well as in modern ways.

**PO 4:** Apply skills in carrying out professional activities such as (i) acquisition, accessioning, classification, cataloguing, and physical processing of documents; (ii) housekeeping operations using library management software and Information and Communication Technologies; (iii) maintaining library collection and; (iv) educating users

### **PROGRAMME SPECIFIC OBJECTIVES (PSOs)**

**PSO 1:** Students will be coping with the increasing demand for higher education and trained human resources in the field of Library & Information Science.

**PSO 2:** students will be able to understand the values and principles of the field and its specialisations with an awareness of overarching social responsibility associated with progressive public service for the public good.

**PSO 3** students will find the opportunities to develop cutting-edge technological skills and competences used across the information professions.

**PSO 4** students will also acquire practical skills to work as Cataloguer and classifier

**PSO 5** Students will have competencies to perform day to day housekeeping operations and provide library services such as circulation, reference and information services to users of a library

<b>COURSE</b>	<b>COURSE OUTCOMES (COs)</b>
<b>B.LIB.I.SC 1<sup>st</sup> Se</b>	
<b>LIS101: FOUNDATION OF LIBRARY AND INFORMATION SCIENCE</b>	<b>CO1:</b> Understand about basic philosophy of library and information science <b>CO2:</b> To know the role of library as a social institute <b>CO3:</b> To know about the Role of library associations and institutions at international level: UNESCO and IFLA <b>CO4:</b> To know about the Resources sharing via networking

<b>LIS102: KNOWLEDGE ORGANISATION AND INFORMATION PROCESSING: THEORY</b>	<p><b>CO1:</b> Learn about the theory of library classification and cataloguing.</p> <p><b>CO2:</b> Learn how to help scholars locate books and other resources.</p> <p><b>CO3: know about the</b> Historical development of library classification schemes</p>
<b>LIS103: KNOWLEDGE ORGANISATION AND INFORMATION PROCESSING: CLASSIFICATION PRACTICE DD&amp; DDC</b>	<p><b>CO1:</b> Understand Dewey Decimal Classification and Colon Classification schemes Get skills to use National and International Classification schemes.</p> <p><b>CO2:</b> Learn practice in the techniques of classifying titles of documents according to Dewey Decimal Classification and Colon Classification.</p>
<b>LIS104: KNOWLEDGE ORGANISATION AND INFORMATION PROCESSING: CATALOGUING PRACTICE* CCC &amp; AACRII</b>	<p><b>CO1:</b> Learn the techniques of cataloguing documents according to Classified Catalogue Code (CCC) and Anglo American Cataloguing Rules (AACR II).</p>
<b>B.LIB.I.SC 2<sup>nd</sup> Semester</b>	
<b>LIS105: MANAGEMENT OF LIBRARIES AND INFORMATION CENTRES</b>	<p><b>CO1:</b> Learn organizing and managing library and information centres while applying principles, techniques and functions of management.</p> <p><b>CO2:</b> Learn routine housekeeping functions of a library.</p>
<b>LIS106: INFORMATION SOURCES AND SERVICES</b>	<p><b>CO1:</b> To impart the knowledge regarding basic reference and information sources.</p> <p><b>CO2:</b> Learn ability in answering queries of users.</p>
<b>LIS107: INFORMATION AND COMMUNICATION TECHNOLOGY: BASICS</b>	<p><b>CO1:</b> Develop the skills of Computers, computer architecture, the System Software and application software, and use of Communication Technology in Libraries.</p>
<b>LIS108: LIBRARY AND ITS USERS</b>	<p><b>CO1:</b> Understand the different categories of users and their information needs</p> <p><b>CO2:</b> Understand the types of Information Systems and information Services.</p>
<b>LIS109: SCHOOL LIBRARY SYSTEM</b>	<p><b>CO1:</b> Understand the role of School library in Elementary and Secondary Education</p>

	<b>CO2:</b> Learn about the sources and services provided by school library.
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## **BSc (Hons) Psychology**

### **Programme Outcome**

- To familiarize students to the field of psychology, give them the necessary exposure to develop interest in the field and thus prepare them for post-graduate programme in psychology.
- Appreciate the different branches and emerging fields of psychology
- To understand the fundamental processes underlying human behavior and the process of human development and change from biological and psychosocial perspective.
- To understand the different aspects of human behavior in the social, cultural and organizational/work context and thus understanding the effects of group membership on individual behavior.
- To understand abnormal behavior and the various components that promotes health and well being through papers such as Health psychology and Positive Psychology.
- To introduce students to the basic aspects in experimentation and testing in psychology so that students are able to conduct simple tests and experiments, write brief reports based on the findings from the tests and experiments
- To familiarize students with basic statistical techniques and fundamentals of research methodology. In addition, students are trained for the application of the same by engaging them in simple quantitative research in small groups.

### **Programme Specific Outcome**

- Students will be able to distinguish between different fields of psychology
- Students will be able to identify the causes behind a behavior in different developmental stages.
- Students will be able to understand behavioral diversity in the context of society, culture and organization.
- Students will be able to explain the causes behind abnormal behavior and will be able to understand therapeutic importance for mental illness with help of principles and theories of health and positive psychology.
- Students will be able to understand the concept of cause and effect relationship behind behavioral outcome with the help of research methodology, experimentation and statistical techniques

### **COURSE OUTCOME**

Semester	Course code	Course name	L	T	P	C
I	PSYH 101	General Psychology-I	5	0	0	5

**Course Objectives and Learning Outcome:** After the completion of this course students will be able:

- Understanding and application of psychological principles, theories and methods of different psychological areas (like learning, memory, etc.) to understand the complexity of human behavior.
- Knowledge of the fundamental physiological functional mechanism behind the Nervous system in the human body.

- It also correlates to the understanding of historical context of different studies and researches.

<b>PSYH 102</b>	<b>General Psychology-II</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** After the completion of this course students will be able:

- Extensive knowledge about different theories and principles of Cognition and Behaviour concerning the areas of Motivation, Emotion, Intelligence, Thinking, and Personality etc.
- Understand the measures involved in different aspects of human behaviour.
- Develop ability to relate the psychological concepts to everyday life events

<b>ENG-102</b>	<b>Communication Skills</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- To stimulate intellectual exercise and to develop communication skills.
- It aims imparting students spectrum of ideas and values emphasizing on their contemporary relevance.
- To guide them in becoming socially responsible citizen and balanced human beings.
- To help students in increasing their confidence in Public speaking.
- To teach them interpersonal skills as: teamwork, negotiation, motivation and self-reflection.

<b>PBI-114</b>	<b>Punjabi Lazmi-I</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਭਾਈ ਵੀਰ ਸਿੰਘ, ਧਨੀ ਰਾਮ ਚਾਤ੍ਰਕ, ਪੂਰਨ ਸਿੰਘ, ਮੋਹਨ ਸਿੰਘ, ਬਾਵਾ ਬਲਵੰਤ, ਪ੍ਰੀਤਮ ਸਿੰਘ ਸਫ਼ੀਰ, ਅੰਮ੍ਰਿਤਾ ਪ੍ਰੀਤਮ, ਹਰਿਭਜਨ ਸਿੰਘ, ਸ਼ਿਵ ਕੁਮਾਰ ਬਟਾਲਵੀ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸਤਾਈ ਜਨਵਰੀ, ਮੁੜ ਵਿਧਵਾ, ਪਠਾਣ ਦੀ ਧੀ, ਤ੍ਰਿਸ਼ਨਾ, ਭੇਤ ਵਾਲੀ ਗੱਲ, ਧਰਤੀ ਹੇਠਲਾ ਬੋਲਦ, ਇਕ ਬਾਲੜੀ ਦੇ ਪਤਾਸੇ, ਮੋਹੜੀ) ਦੇ ਸੰਦਰਭ
- ਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਵੰਨਗੀਆਂ, ਉਪਭਾਸ਼ਾ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਭਾਸ਼ਾ ਤੇ ਉਪਭਾਸ਼ਾ ਦਾ ਅੰਤਰ-ਸੰਬੰਧ, ਪੰਜਾਬੀ ਦੀਆਂ ਉਪਭਾਸ਼ਾਈ ਵੰਨਗੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਸ਼ਬਦ ਸ਼੍ਰੇਣੀਆਂ : ਨਾਂਵ, ਪੜਨਾਂਵ, ਵਿਸ਼ੇਸ਼ਣ, ਕਿਰਿਆ, ਕਿਰਿਆ-ਵਿਸ਼ੇਸ਼ਣ, ਸਬੰਧਕ, ਯੋਜਕ, ਵਿਸਮਿਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।

<b>ENG-101</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To Understand the correct application of the subject .
- To enrich their vocabulary
- To Develop beginning vocabulary and aesthetic sense both
- Learn to make coherent sentences and propound coherent ideas
- Close Reading and critical analysis of the Text

<b>EDU-101</b>	<b>Human Values and Ethics</b>	<b>2</b>	<b>0</b>	<b>0</b>	<b>2</b>
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- Understanding the need, basic guidelines, content and process of value education, self-exploration, continuous happiness and prosperity, fulfillment of basic aspirations of human being.



- To learn importance of universal human values and ethical human conduct, basis for holistic alternative towards universal human order
- To learn about Professional ethics and issues in professional ethics.

<b>COMP-101</b>	<b>Introduction to Computer Applications</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- To know basic applications of computers in different organizations.
- Understanding, types of Computer systems like Micro, Mini, Mainframe and Super Computers.
- To know about input and output devices, Data Processing and storage.

<b>II</b>	<b>PSYH 121</b>	<b>General Psychology-III</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** After the completion of this course students will be able

- To introduce and initiate the student into the world of Psychology with a brief historical sketch of the science of psychology and a glimpse into the methods used in the study of human behaviour.
- To understand the fundamental processes underlying human behavior such as biological foundations of behaviour, processes underlying sensation, perception, cognition, memory, learning, motivation, emotion, individual differences, intelligence, personality and states of consciousness.
- To apply the principles of psychology in day-to-day life for a better understanding of themselves and others.
- 4.To understand further the fundamental processes underlying human behavior such as learning, motivation, emotion, individual differences, intelligence, personality and states of consciousness.

<b>PSYH 122</b>	<b>Educational Psychology</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Understand how psychological theories and principles relate to everyday life and apply knowledge of Behaviour modification and life skill training to solve everyday problems.
- Students are exposed to the elementary scientific research methods, techniques, counselling skills, ethics and evaluating skills of Psychology in educational settings.
- Apply psychological principles to understand personal as well as social issues and problems.
- Apply the principles of psychology in day-to-day life for a better understanding of themselves and others.

<b>STAT-102</b>	<b>Statistics</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Understand the basic concept of statistics in psychology.
- Explore and get introduced to the various statistical tools (parametric and non-parametric) used for analysis.

- Learn categorization and presentation of data; graphical representation used to communicate data
- Knowledge about hypothesis testing
- Execute qualitative and quantitative data analysis

<b>ENG-122</b>	<b>Business Communication Skills</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- To provide students fair knowledge of English and make them able to handle the future jobs in industry.
- To help the students in acquiring proficiency, both in spoken and written language.
- To develop their vocabulary and comprehension skills.
- To improve their grammar and enhance writing skills.
- To assist students in developing formal and informal communication skills.

<b>PBI-124</b>	<b>Punjabi Lazmi-2</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਪੁਸਤਕ ਕਾਵਿ-ਧਾਰਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਸ.ਸ. ਮੀਸ਼ਾ, ਜਸਬੀਰ ਸਿੰਘ ਆਹਲੂਵਾਲੀਆ, ਰਵਿੰਦਰ ਰਵੀ, ਜਗਤਾਰ, ਸੁਰਜੀਤ ਪਾਤਰ, ਪਾਸ਼, ਹਰਿਭਜਨ ਹਲਵਾਰਵੀ, ਮਨਜੀਤ ਟਿਵਾਣਾ ਦੀ ਕਵਿਤਾ ਦੇ ਹਵਾਲੇ ਨਾਲ ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਪੁਸਤਕ ਕਥਾ-ਰੰਗ ਦੇ ਹਵਾਲੇ ਨਾਲ ਅੱਠ ਕਹਾਣੀਆਂ (ਸ਼ਹੀਦ, ਜਿਊਣ ਜੋਗੇ, ਮੂਨ ਦੀ ਅੱਖ, ਇੱਕੀਵੀਂ ਸਦੀ, ਬਠਲੂ ਚਮਿਆਰ, ਜਿੱਥੋਂ ਸੂਰਜ ਉੱਗਦਾ ਹੈ, ਡੁੰਮ) ਦੇ ਸੰਦਰਭ ਵਿਚ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਗੁਰਮੁਖੀ ਲਿਪੀ: ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦੀਆਂ ਵਿਸ਼ੇਸ਼ਤਾਵਾਂ, ਗੁਰਮੁਖੀ ਲਿਪੀ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਨਾਲ ਸੰਬੰਧ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਵਿਆਕਰਨਿਕ ਸ਼੍ਰੇਣੀਆਂ: ਲੇੜ, ਮਹੱਤਵ ਅਤੇ ਮੁੱਖ ਸੰਕਲਪ - ਵਚਨ, ਲਿੰਗ, ਪੁਰਖ, ਕਾਲ, ਕਾਰਕ ਸਬੰਧੀ ਸਿਧਾਂਤਕ ਅਤੇ ਵਿਹਾਰਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।

<b>ENG-121</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To enhance the critical thinking of the students with the help of poetry and essays.
- To read and appreciate the beauty of stories on their own.
- To teach them the intricacies of grammar so that they can make sentences on their own without any grammatical errors.
- Enable them to understand the difference between formal and informal communication with the help of letter writing.
- To enlighten and aware students about the literary characteristics of various poetic forms.

<b>EVS-301</b>	<b>Environmental Science</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To understand the need for public awareness for environment.
- To learn about renewable and non-renewable resources, problems associated with Natural resources.

- To know about ecosystems, structure and function of an ecosystem.
- Understand biodiversity and impact on environment, conservations of bio resources.
- Environmental pollution and causes and remedies.

<b>III</b>	<b>PSYH 201</b>	<b>Psychological Testing</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Analyze and apply the understanding of psychological testing.
- Interpret and assess the role of psychological testing in various settings.
- Effectively synthesize and apply the variations in scales and tests.
- Recognize the various types of psychological tests
- Organize the various steps in construction of a psychological test
- Review the ethical issues surrounding psychometric evaluation, testing and interpretation in day to day life

<b>PSYH 202</b>	<b>Experimental Psychology-Practical- 1</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Review the concepts of psychology through the mediums of the experiments.
- Understand the rationale, strengths and limitations of the experimental method of gaining knowledge about mental and behavioural processes.
- Develop skills of conducting and documenting experiments in the field of psychology.
- Learn how to design experimental and non-experimental studies.
- To enhance the scientific temper of the students by providing them with the experimental knowledge of psychology.

<b>PSYH 203</b>	<b>Sports Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Understand how psychological theories and principles relate to sports psychology and applied Knowledge of Behaviour modification and life skill training in field of supports.
- Students are exposed to basic scientific research methods, techniques, counselling skills, ethics and evaluate skills of sports Psychology.
- Apply psychological principles to personal and social issues and problems

<b>ENG- 202</b>	<b>Fundamental Communication Skills</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- To enable all students to develop positive self –concepts.
- To enhance their skills in communicating competently in groups and organizations.
- To aware students with the major practices in effective public speaking.
- To develop professional skills that prepare them for immediate employment and life- long learning advanced areas of job field.
- To developing an understanding of the various writing tasks for specific audience and purpose.

<b>PBI- 214</b>	<b>Punjabi Lazmi-3</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿੱਚੋਂ ਗੁਰਮਤਿ ਕਾਵਿ (ਭਗਤ ਬਾਣੀ+ਗੁਰੂ ਸਾਹਿਬਾਨਾਂ ਦੀ ਬਾਣੀ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਇੱਕ ਐਤਵਾਰ, ਜੁੱਤੀਆਂ ਦਾ ਜੋੜਾ, ਨਵਾਂ ਚਾਨਣ, ਡਾਕਟਰ ਪਲਟਾ) ਦੇ ਹਵਾਲੇ ਨਾਲ ਪੰਜਾਬੀ ਨਾਟਕ ਅਤੇ ਇਕਾਂਗੀ ਸਬੰਧੀ ਸੂਝ ਪੈਦਾ ਕਰਨੀ।
- ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦਾ ਜਨਮ ਅਤੇ ਵਿਕਾਸ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੀ ਵਰਤਮਾਨ ਹਾਲਤ (ਸਾਹਿਤ, ਮੀਡੀਆ ਅਤੇ ਵਿੱਦਿਅਕ ਅਦਾਰਿਆਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ)
- ਧੁਨੀ ਵਿਗਿਆਨ ਅਤੇ ਧੁਨੀ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ, ਵਰਗੀਕਰਨ ਅਤੇ ਅੰਤਰ-ਨਿਖੇੜ। ਧੁਨੀਆਂ ਦਾ ਵਰਗੀਕਰਨ : ਖੰਡੀ ਅਤੇ ਅਖੰਡੀ ਧੁਨੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਦਫ਼ਤਰੀ ਚਿੱਠੀ-ਪੱਤਰ ਲੇਖਣ ਦਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।

<b>ENG-201</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To trace the development history of English Literature.
- To interpret the text from contemporary point of view.
- To critically analysis these text as a source of wisdom.
- To provide them knowledge of English Grammar as, types of clause, translation, complex and compound sentences.
- To develop critical thinking and imagination through long and short stories, poems and drama.

<b>IV</b>	<b>PSYH 221</b>	<b>Recent Perspectives of Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** At the end of this course students will be able

- Understand basic concepts of recent psychology and its relationship to other branches of psychology
- Gain fundamental understanding of well-being and happiness in the context of positive psychology
- Grasp basic cognitive states and processes in recent psychology
- Transfer the theoretical concepts into practical setting
- Develop an awareness of applications and implications of positive psychology concepts and theories
- Equip himself /herself with the skill and competence to apply positive psychology principles in a range of environments to increase individual and collective wellbeing

<b>PSYH 222</b>	<b>Social Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcome:** After the completion of this course, a student will be able to:

- Understand the historical and scientific origin and development of the field in the western and Indian context.
- Describe the development of the self and the dynamics of interpersonal attraction, prosocial behaviour, aggression, prejudice, group processes and attitude formation and change in a social context.
- Comprehend the nature of scientific methods employed to study behaviour in the social context.

<b>PSYH 223</b>	<b>Experimental Psychology-Practical II</b>	<b>0</b>	<b>1</b>	<b>2</b>	<b>3</b>
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**Course Objectives and Learning Outcomes** At the end of the course, students will be able to

- Learn, review, understand and to apply of the concepts of psychology through the medium of the experiments
- Develop the skills of conducting and documenting experiments in the field of psychology.
- Knowledge about the experiments that lead towards the development of the field of psychology and explanation of the contributions of various thinkers in the field.
- Conduct experiments and administer psychological scales to a subject
- Make interpretations and draw conclusions based on the norms given in the manual
- Write a report which reflects the details of the experiment/ test, the aim, applications, procedure of administration and subject results
- Using simple statistical techniques for carrying out group based small quantitative research projects.

<b>ENG-222</b>	<b>Professional Writing &amp; Communication Skills</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- Offers an opportunity to learn and apply principles of interpersonal communication in daily life.
- Emphasis on psychological, social, cultural and linguistic factors, which affect communication.
- It helps students to improve their communication skills in personal as well as in professional spheres.
- Enable students to make use of various kinds of non-verbal communication and to understand symbols.
- Improve their listening as well as speaking skills.

<b>PBI-224</b>	<b>Punjabi Lazmi-4</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਪਾਠ-ਪੁਸਤਕ - ਪੰਜਾਬੀ ਕਾਵਿ ਸੰਗ੍ਰਿਹ (1700 ਈ. ਤੱਕ) ਵਿੱਚੋਂ ਸੂਫੀ ਕਾਵਿ ਅਤੇ ਕਿੱਸਾ ਕਾਵਿ (ਸ਼ਾਹ ਹੁਸੈਨ ਦੀਆਂ ਕਾਫ਼ੀਆਂ+ਹੀਰ ਦਮੋਦਰ) ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਪਾਠ-ਪੁਸਤਕ - ਮੰਚ ਦਰਸ਼ਨ ਵਿੱਚੋਂ ਅਗਲੀਆਂ ਪੰਜ ਇਕਾਂਗੀਆਂ ( ਗਊਮੁਖਾ-ਸ਼ੇਰਮੁਖਾ, ਜ਼ੈਲਦਾਰ, ਇਕ ਵਿਚਾਰੀ ਮਾਂ, ਅੰਨ੍ਹੇ ਨਿਸ਼ਾਨਚੀ, ਚਾਬੀਆਂ) ਦੇ ਆਧਾਰ 'ਤੇ ਪੰਜਾਬੀ ਇਕਾਂਗੀ ਬਾਰੇ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।

- ਸ਼ਬਦ ਵਿਗਿਆਨ : ਪਰਿਭਾਸ਼ਾ, ਬਣਤਰ ਅਤੇ ਰਚਨਾ; ਪੰਜਾਬੀ ਭਾਵੇਂਸ਼ ਵਿਉਂਤ : ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ।
- ਪੰਜਾਬੀ ਸ਼ਬਦ ਜੋੜਾਂ ਦੇ ਨਿਯਮ ਅਤੇ ਸਮੱਸਿਆਵਾਂ।
- ਇਸ਼ਤਿਹਾਰ, ਪ੍ਰੈੱਸ ਨੋਟ ਅਤੇ ਖ਼ਬਰਾਂ : ਲਿਖਣ ਦੀਆਂ ਵਿਧੀਆਂ ਅਤੇ ਨੇਮਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।

<b>ENG-221</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To equip them to attempt practical criticism of plays, passages and poems  
To read and appreciate stories on their own.
- To develop a comparative perspective to study the texts
- To recognise and discuss the aspects of an author.

<b>V</b>	<b>PSYH 301</b>	<b>Organizational Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** After completing the course the students will be able to:

- Demonstrate fundamental knowledge about need and scope of I/O Psychology
- Be aware of the brief history and various related fields of I/O Psychology
- Learn about employee motivation, job satisfaction and leadership styles.
- Understand the concept of organizational culture and learn the various types and functions of organizational culture
- Comprehend the concept of Job analysis and be aware about the various methods of Job analysis.
- Learn about the process of employee selection and understand the various methods of selection process with special emphasis on psychological testing.
- Demonstrate knowledge about the processes of training and performance appraisal
- Understand the meaning of consumer behaviour and the decision making process of the consumer.

<b>PSYH 302</b>	<b>Abnormal Psychology-I</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objective and Learning Outcome:** At the completion of the course students will be able:

- To have knowledge of different aspects of abnormal behaviour.
- To know the historical development of the study of abnormal behaviour, criteria and perspectives in abnormal behaviour, common classification systems, and range of disorders including anxiety disorders, mood disorders, schizophrenia, disorders generally observed at childhood and adolescence, and personality disorders.
- Understand various behavioural dysfunctions and use the same in day-to-day life.

<b>PSYH 303</b>	<b>Child and Adolescent Development</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Understand basic concepts, issues and debates in the field of developmental psychology.
- Appreciate principal theories of lifespan development.
- Comprehend human development as progressing through different stages.



- Discuss development from the perspective of different domains such as physical, motor, cognitive, and psychosocial.
- Understand the role of family, peers and community in influencing development at different stages.

<b>ENG-302</b>	<b>English for Technical Communication</b>	<b>2</b>	<b>0</b>	<b>1</b>	<b>3</b>
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- To enhance their language skills for greater accuracy and precision
- Learn how to persuade the audience
- Deliver presentations and receive constructive feedback
- Active Participation in Discussion and Debates
- Produce technical documentation with accuracy and detail
- To enhance the Writing Skills using professional tools

<b>PBI-314</b>	<b>Punjabi Lazmi-5</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਨਾਵਲ : ਸੁੰਦਰੀ ( ਭਾਈ ਵੀਰ ਸਿੰਘ) ਦਾ ਪਾਠਗਤ ਅਤੇ ਵਿਸ਼ਾਗਤ ਅਧਿਐਨ ਕਰਵਾਉਣਾ।
- ਪਾਠ-ਪੁਸਤਕ - ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਵਿਚਲੇ ਲੇਖਾਂ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਿਦਿਆਰਥੀਆਂ ਵਿਚ ਵਾਤਾਵਰਨ ਚੇਤਨਾ ਪੈਦਾ ਕਰਨੀ।
- ਵਾਕ-ਵਿਉਂਤ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ; ਰੂਪ ਦੇ ਆਧਾਰ ‘ਤੇ ਵਾਕ ਵੰਡ- ਸਧਾਰਨ, ਸੰਯੁਕਤ, ਮਿਸ਼ਰਤ। ਕਾਰਜ ਦੇ ਆਧਾਰ ਤੇ ਵਾਕ ਵੰਡ- ਬਿਆਨੀਆ, ਸਵਾਲੀਆ ਅਤੇ ਹੁਕਮੀ ਵਾਕ।
- ਸੰਚਾਰ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਵਰਗੀਕਰਨ, ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਸੰਚਾਰ ਸਾਧਨ: ਪ੍ਰਿੰਟ ਅਤੇ ਬਿਜਲਈ ਮੀਡੀਆ (ਅਖ਼ਬਾਰ, ਰਸਾਲੇ, ਰੇਡੀਓ, ਟੈਲੀਵਿਜ਼ਨ, ਕੰਪਿਊਟਰ ਅਤੇ ਇੰਟਰਨੈੱਟ ਦਾ ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਲਈ ਯੋਗਦਾਨ)
- ਕਿਸੇ ਅਣਡਿੱਠੇ ਪੈਰੇ ਦਾ ਢੁੱਕਵਾਂ ਸਿਰਲੇਖ ਅਤੇ ਸੰਖੇਪ-ਰਚਨਾ ਅਭਿਆਸ ਕਰਵਾਉਣਾ।

<b>ENG- 301</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- Enable students to understand various kinds of business communication tactics and to use them in professional sphere.
- Make students able to read and understand poetry by enhancing their critical ability.
- Make them able to inculcate habits of pleasurable reading with the help of novel reading.
- To learn to use grammar correctly.

<b>VI</b>	<b>PSYH 321</b>	<b>Abnormal Psychology-II</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- To have knowledge of different aspects of abnormal behaviour.
- To know the historical development of the study of abnormal behaviour, criteria and perspectives in abnormal behaviour, common classification systems, and range of disorders including anxiety disorders, mood disorders, schizophrenia, disorders generally observed at childhood and adolescence, and personality disorders.
- Understand various behavioural dysfunctions and use the same in day-to-day life.

<b>PSYH 322</b>	<b>Counselling Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Apply and develop conceptual difference between guidance counseling & psychotherapy.
- Develop technique and implication of applied counseling skills in areas of practice.
- Evaluate counseling theories & their application to the outside world.

**Classify the role and responsibilities of a professional counsellor**

Student will be able to:

- Evaluate various psychotherapies and schools in counselling techniques.
- Develop skills of eclectic therapeutic plans.
- Identify the techniques to practice in the therapy encounter and how those techniques should be implemented with a variety of disorders and psychosocial issues

<b>PSYH-323</b>	<b>Project Work</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>

**Course Objectives and Learning Outcomes:** Students will be able to:

- Understand the concept of project work and research
- Develop the research aptitude
- Learn the practical aspect of psychological theories by field investigation and case studies

<b>ENG-322</b>	<b>Technical Communication- Principles and Practices</b>	<b>0</b>	<b>0</b>	<b>4</b>	<b>4</b>
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- To enhance their language skills for greater accuracy and precision
- Learn how to persuade the audience
- Deliver presentations and receive constructive feedback
- Active Participation in Discussion and Debates
- Produce technical documentation with accuracy and detail

<b>PBI-324</b>	<b>Punjabi Lazmi-6</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- ਪਾਠ-ਪੁਸਤਕ - ਯਾਦਾਂ ਦੀ ਕੰਨੀ ਦੇ ਆਧਾਰ 'ਤੇ ਵਾਰਤਕ ਸਬੰਧੀ ਸਮਝ-ਸੂਝ ਪੈਦਾ ਕਰਨੀ।
- ਪਾਠ-ਪੁਸਤਕ - ਵਾਰਤਕ ਵਿਵੇਕ ਦੇ ਆਧਾਰ 'ਤੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਵਿਸ਼ਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।
- ਭਾਸ਼ਾ-ਵਿਗਿਆਨਕ ਸ਼ਬਦਾਵਲੀ: ਦੁਭਾਸ਼ਾਵਾਦ, ਬਹੁਭਾਸ਼ਾਵਾਦ, ਮਾਂ-ਬੋਲੀ, ਦੂਜੀ ਭਾਸ਼ਾ, ਸਰਕਾਰੀ ਭਾਸ਼ਾ।
- ਅਰਥ-ਵਿਗਿਆਨ: ਪਰਿਭਾਸ਼ਾ ਅਤੇ ਲੋੜ, ਅਰਥ ਵਿਸਤਾਰ ਅਤੇ ਸੰਕੋਚ, ਅਰਥ ਉਤਰਾਅ ਅਤੇ ਚੜ੍ਹਾਅ
- ਪੈਰਾ ਅਨੁਵਾਦ : ਅੰਗਰੇਜ਼ੀ ਤੋਂ ਪੰਜਾਬੀ (ਪੈਰਾ ਲਗਭਗ 100-125 ਸ਼ਬਦਾਂ ਦਾ ਹੋਵੇ)ਅਭਿਆਸ ਕਰਵਾਉਣਾ।

<b>ENG- 321</b>	<b>Compulsory English</b>	<b>3</b>	<b>0</b>	<b>0</b>	<b>3</b>
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- To explore different genres and inculcate critical powers by looking at their meticulous details.
- To analyze various types of genres ranging from poetry to drama with reference to thematic and other approaches.
- Enable students to have a peep into the phonetic system of English language by using intonation and stress pattern.

- To teach syllable structure and syllable division by focusing on mono and disyllabic words.
- To teach them to use grammar correctly.

## Program Outcomes, Program Specific Outcomes & Course Outcomes of M.A. English

<b>Program Outcomes</b>	<b>M.A. (English) Program</b>
<b>PO1.</b>	Students will develop an ability to read texts in relation to their historical and cultural contexts, in order to gain a richer understanding of both text and context, and to become more aware of themselves as situated historically and culturally.
<b>PO2.</b>	Students will value literature, language, and imagination; they will develop a passion for literature and language.
<b>PO3.</b>	They will appreciate literature's ability to elicit feeling, cultivate the imagination, and call us to account as humans.
<b>PO4.</b>	They will cultivate their capacity to judge the aesthetic and ethical value of literary texts—and be able to articulate the standards behind their judgments.
<b>PO5.</b>	They will appreciate the expressive use of language as a fundamental and sustaining human activity, preparing for a life of learning as readers and writers.
<b>PO6.</b>	Students will develop an appreciation of how the formal elements of language and genre shape meaning.
<b>Program Specific Outcomes</b>	<b>PSOs of M.A. (English) Program</b>
<b>PSO1.</b>	The students acquire in depth knowledge in literature and humanities which make them sensitive and sensible enough to solve the issues related with mankind.
<b>PSO2.</b>	The students are able to make distinction between the said registers and understand various novelistic discourses as well as dramatic actions for the culture and context of the said literary work.
<b>PSO3.</b>	The learners deploy learnt lessons into their practical lives drawn from stories and poems which sensitize them towards humans, animals and nature.
<b>PSO4.</b>	The student start understanding the genres of literature by interpreting prescribed texts.
<b>PSO5.</b>	The learners understand and appreciate the history and development of Indian literature through the essays.
<b>PSO6.</b>	The learners are able analyse the prescribed novels.
<b>Course Outcomes</b>	<b>Outcomes MA (English) Sem. I</b>
<b>Introduction to Literature ENG 521</b>	CO I: To acquire familiarity with a wide variety of forms, styles, structures, and modes in English literature CO II: To identify and understand the significance of these forms in shaping a text's meaning. CO III: To equip them to attempt practical criticism of plays, passages and poems CO IV: To understand how various genres evolved

## Program Outcomes, Program Specific Outcomes & Course Outcomes of M.A. English

	CO V: To learn about prominent writers and famous works in English literature
<b>Introduction to Phonetics ENG - 523</b>	CO I: To learn to use correct articulation of English sounds CO II: To use intonation and stress properly. CO III: To appreciate literary form and structure in shaping a text's meaning CO IV: To demonstrate the awareness of evolution theory of language by varied culture CO V: To become proficient in English for global competency
<b>Major Literary Movements &amp; History of English Literature-I ENG - 524</b>	CO I: To learn the history of literary criticism and various literary theories. CO II: To apply critical and technical theory and vocabulary to describe and analyze, and formulate an argument about literary and other texts. CO III: To think about the non-fixity of meaning of literary texts. CO IV: To develop a skill in applying various literary theories in interpreting a specific text. CO V: To understand the growth and development of English literature
<b>Introduction to Communication Skills—Theories and Practice ENG – 525</b>	CO I: To communicate ethically, responsibly, and effectively as local, national, international, global citizens and leaders. CO II: To lead to a greater understanding of the human communicative action through an objective study of language. CO III: To help students move towards better and intelligible pronunciation and to improve the general standard of pronunciation in everyday conversation. CO IV: To improve their analytical skills and help them to evaluate the different types of works. CO V: To communicate competently in groups and organizations
<b>Course Outcomes</b>	<b>Outcomes MA (English) Sem. II</b>
<b>British Drama ENG - 531</b>	CO I: To identify the distinct literary genres of the tragedies, comedies, and histories present in various works CO II: To acquaint them with the literary genre of British Drama, and the rhetorical aspect of drama help them understand how to represent their experience and ideas critically, creatively, and persuasively through the medium of language CO III: To critically analyze British works and interpretation of various critics. CO IV: To display a working knowledge of historic, socio-political, and dramatic trends in plays by the most important playwrights from differing time periods CO V: To show familiarity with major literary works by British writers in field of poetry and drama up to the 17th century.
<b>Introduction to language &amp; Professional Communication Skills</b>	CO I: To write clearly, effectively, and creatively, and adjust writing style appropriately to the content, the context, and nature of the subject. CO II: To think about the relation between language and literature CO III: To possess skills to effectively deliver formal and informal oral presentations to a variety of audiences in multiple contexts.

## Program Outcomes, Program Specific Outcomes & Course Outcomes of M.A. English

<b>ENG - 532</b>	<p>CO IV: To help the students overcome the fear of facing an audience, train the students in planning a speech and then draft it</p> <p>CO V: To acquaint students with the major practices in effective public speaking</p>
<b>Grammar and Morphology of English</b> <b>ENG - 533</b>	<p>CO I: To develop an in-depth knowledge of various approaches and methods- Direct method, Reading method, Structural Method and Audio-Lingual Method.</p> <p>CO II: To Develop an overview of Communicative Competence and Linguistic Competence</p> <p>CO III: To study of the levels of language description: phonology, morphology and syntax.</p> <p>CO IV: To focus on word stress, aspects of connected speech and tones of intonation which help the learner to improve his/her pronunciation.</p> <p>CO V: To familiarize students with the key concepts of linguistics and develop awareness of the latest trends in language study.</p>
<b>Major Literary Movements &amp; History of English Literature – II</b> <b>ENG - 534</b>	<p>CO I: To understand the critical traditions of English literature</p> <p>CO II: To appreciate these texts as a source of great wisdom.</p> <p>CO III: To interpret these texts from contemporary points of view.</p> <p>CO IV: To trace the developmental history of English Literature from Old English Period to 19th century</p> <p>CO V: To examine various literary techniques that writers of 20th century use in writing their texts, and demonstrate an understanding of these techniques.</p>
<b>Course Outcomes</b>	<b>Outcomes MA (English) Sem. III</b>
<b>British Novel</b> <b>ENG - 551</b>	<p>CO I: To trace the developmental history of English Literature from Old English Period to 19th century.</p> <p>CO II: To help study on Theatre of the Absurd and Globalization</p> <p>CO III: To raise significant questions, gather relevant evidence, reach well-reasoned conclusions, weigh alternative systems of thought, and write as means of intellectual inquiry and creative expression.</p> <p>CO IV: To train them in writing critiques of these novels</p> <p>CO V: To enable students to recognize themes and techniques.</p>
<b>Advanced Business Communication</b> <b>ENG - 552</b>	<p>CO I: To increase confidence in speaking publicly.</p> <p>CO II: To develop an understanding of the various writing tasks for specific audiences and purposes</p> <p>CO III: To develop professional skills that prepare them for immediate employment and for life-long learning in advanced areas of management and related fields.</p> <p>CO IV: To learn interpersonal skills such as teamwork, leadership and negotiation, and interpersonal qualities like motivation, initiative and critical self-reflection</p> <p>CO V: To apply knowledge in different situations and the processing sk acquired through the application and synthesis of knowledge</p>



## Program Outcomes, Program Specific Outcomes & Course Outcomes of M.A. English

<b>British &amp; American Poetry</b> <b>ENG - 553</b>	<p>CO I: To identify and account for distinct literary characteristics of various poetic forms.</p> <p>CO II: To analyze poetic texts using appropriate terms such as diction, tone, imagery, figures of speech, motif, etc</p> <p>CO III: To develop a basic communications plan and describe the role of internal and external communications</p> <p>CO IV: To develop a deeper appreciation of cultural diversity by introducing them to poetry from a variety of cultures</p> <p>CO V: To improve their understanding of the world the poets lived in</p>
<b>Literary Criticism</b> <b>ENG - 554</b>	<p>CO I: To understand the critical traditions of English literature</p> <p>CO II: To trace the development of criticism through the ages.</p> <p>CO III: To recognize the value of multiple perspectives and develop competence in giving and receiving constructive criticism</p> <p>CO IV: To demonstrate knowledge of the history and culture.</p> <p>CO V: To learn historical contexts, psycho-social aspects and discern the various cultural and moral values associated with the texts.</p>
<b>Course Outcomes</b>	<b>Outcomes MA (English) Sem. IV</b>
<b>Media Studies</b> <b>ENG - 572</b>	<p>CO I: To write a variety of mass media products, including news stories, press releases, and advertising copy, following accepted journalistic standards, including Associated Press style.</p> <p>CO II: To explore the world of media or journalism</p> <p>CO III: To improve communication in various travel situations for job opportunities</p> <p>CO IV: To create and design emerging media products, including blogs, digital audio, digital video, social media, digital photography, and multimedia</p> <p>CO V: To apply relevant case law involving journalism, the First Amendment and other mass media issues</p>
<b>Indian Writing in English</b> <b>ENG - 573</b>	<p>CO I: How and why Indian literature emerged as a distinct field of study.</p> <p>CO II: To show familiarity with major literary works by British writers in the field of Drama and Poetry.</p> <p>CO III: To interpret the works of great writers of Indian writers in English</p> <p>CO IV: To demonstrate, through discussion and writing, an understanding of significant cultural and societal issues presented in Indian English literature</p> <p>CO V: To raise significant questions, reach well-reasoned conclusions, weigh alternative systems of thought, and enhance their creative expression.</p>
<b>English Language Teaching: Approaches and Methods</b> <b>ENG - 574</b>	<p>CO I: To learn to appreciate literature and writers from various nations and cultures.</p> <p>CO II: To read and understand about the rich classical texts</p> <p>CO III: To enhance their ability to understand, appreciate, and discuss works of literature through extensive reading and discussion of short stories, novels and plays.</p>

## Program Outcomes, Program Specific Outcomes & Course Outcomes of M.A. English

	<p>CO IV: To apply literary terminology for Narrative, Poetic and Dramatic genres</p> <p>CO V: To appreciate literary form and structure in shaping a text's meaning</p>
<b>Master's Research ENG 600</b>	<p>CO I: To learn to appreciate literature and writers from various nations and cultures.</p> <p>CO II: To undertake a revisionary reading to discover the hidden voices within a text and realize while focusing on an interrogation of the Western canon.</p> <p>CO III: To learn to see critically the rising trends of globalization, capitalism and multi-culturalism.</p> <p>CO IV: To enhances aesthetic sense – admiring the beauty of life and literature</p> <p>CO V: To deepen the knowledge of contemporary world culture through literature</p>

<b>M.A Instrumental</b>	
<b>Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. To be able to persue higher studies in the discipline</li> <li>2. To be able to expertise as performer at AIR &amp; doordarshan level.</li> <li>3. To be able to work as teacher at PGT Level.</li> <li>4. To be able to persue different genre of Music as collaborative fusion bands.</li> </ol>
<b>Programme Specific Outcome</b>	<ol style="list-style-type: none"> <li>1. To be able to play traditional style of instrumental recital.</li> <li>2. To be able to expertise proficiency in playing the instrument.</li> <li>3. To have a an overall non- theoretical and grammatical concepts of Indian Classical Music.</li> <li>4. To aquire the knowledge of Indian Classical Music from ancient to modern times.</li> <li>5. To develop a critical and analytical understanding of Gurmat Sangeet.</li> </ol>
<b>Semester 1</b>	
<b>Course Learning Outcome MAIN- 521 (General and Applied Theory of Indian Classical Music); Part -1</b>	<ol style="list-style-type: none"> <li>1. Students learn to write the Notation of Talas with Laya karies.</li> <li>2. Acquire to know the difference between Tantarkari &amp; Gayaki Ang in Instrumental Music.</li> <li>3. The student gets to know the History and comparative study of the Ragas.</li> <li>4. Students learn to study of classification of Indian Musical Instruments.</li> </ol>
<b>Course Learning Outcome MAIN – 522 (Aesthetical study of Indian Music); Part-1</b>	<ol style="list-style-type: none"> <li>1. Students gain knowledge of technical terminology of the Instruments.</li> <li>2. The students get to know the concepts Raag and Rasa, detailed study of the Gram, evolution of Notation system.</li> <li>3. Students learn the description of various prescribed Ragas.</li> <li>4. Students learn to about tanpura &amp; Shayak Naad.</li> </ol>
<b>Course Learning Outcome MAIN – 523 (Practical- Staze Performance)</b>	<ol style="list-style-type: none"> <li>1. The students will know how to tune their respective own Instruments.</li> <li>2. They will grasp the various grammatical aspects of the prescribed Ragas, like how they arise, what are the respective rules that govern these ragas, what are the performing in the prescribed ragas.</li> <li>3. He will learn the art of playing.</li> <li>4. The students will develop the confidence to perform a raga for a long duration of time.</li> </ol>

	5. Students learn to play dhuns.
<b>Course Learning Outcome MAIN – 524 (Practical; Viva- VOCE)</b>	<ol style="list-style-type: none"> <li>1. With other basic ragas, the students will understand how to use the flat and sharp notes I ragas with tenel phrases</li> <li>2. The student will be able to explain the grammatical rules of a raga in detail.</li> <li>3. He will develop the confidence to differentiate between similar raagas.</li> </ol>
<b>Semester 2<sup>nd</sup></b>	
<b>Course Learning Outcome MAIN – 531 (General and Applied Theory of Indian Classical Music); Part -2</b>	<ol style="list-style-type: none"> <li>1. The student will gain knowledge about the various styles of playing instrumental music that will help him to enjoy the concert like Solo presentation &amp; Jugalbandi etc.</li> <li>2. The student will come to know about the ability to write composition in Vilambit Gat and Dhun Gat. Student gain knowledge of technical terminology of the Instruments.</li> </ol>
<b>Course Learning Outcome MAIN – 532 (Aesthetical study of Indian Music); Part-2</b>	<ol style="list-style-type: none"> <li>1. Acquire learn &amp; understand the importance of Laya &amp; Taal in Indian Music.</li> <li>2. Students learn about to make new Good composition quality.</li> <li>3. Students gain knowledge of technical terminology of the Instruments.</li> </ol>
<b>Course Learning Outcome MAIN – 533 (Practical- Staze Performance)</b>	<ol style="list-style-type: none"> <li>1. The students will develop confidence to perform a raag for a long duration of time.</li> <li>2. The student will know how to tune their own Instruments.</li> <li>3. The students develop the ability to play fast composition in various ragas with elaboration.</li> <li>4. Students will able to hold opted instrument and its function.</li> </ol>
<b>Course Learning Outcome MAIN – 534 (Practical; Viva- VOCE)</b>	<ol style="list-style-type: none"> <li>1. The students will be able to explain the grammatical rules of a raag in detail.</li> <li>2. He will also be able to demonstrate</li> <li>3. How to separate similar sounding ragas.</li> <li>4. The students understand the characteristics of selected Ragas of the Unit.</li> </ol>
<b>Semester 3<sup>rd</sup></b>	
<b>Course Learning Outcome MAIN – 551 (History of Indian Music ); Part-1</b>	<ol style="list-style-type: none"> <li>1. The student will come to know about how various musical Instruments of India are made, and are categorized on the basis of solids, animal skin, wind and metallic strings. This will enhance his knowledge and will be beneficial in future research on musical Instruments.</li> <li>2. The student will know about the life and contribution of legends like Smt. Hira Bai Barodkar, Smt (dr.) N Rajam,</li> </ol>

	<p>and how their works have shaped the present Hindustan music.</p> <ol style="list-style-type: none"> <li>3. The student will come to know about Indian music during the Vedic times. He will thus understand its progress and development from then to now. It will enhance his knowledge in the field of music and also help him in the field of research in ancient Indian Music.</li> <li>4. The students understand the History &amp; Comparative study of the Ragas.</li> </ol>
<b>Course Learning Outcome MAIN – 552</b> <b>(Critical Study of Gurmat Sangeet ); Part -1</b>	<ol style="list-style-type: none"> <li>1. Students will come to know about Importance of Music in Siri Guru Granth Sahib Ji.</li> <li>2. The Students will come to know about Ragas of Gurmat Sangeet which are based of Folk Music. This Knowledge will help him to become a better stage performer of Gurmat Sangeet.</li> </ol>
<b>Course Learning Outcome MAIN – 553</b> <b>(Practical- Stage Performance)</b>	<ol style="list-style-type: none"> <li>1. The students of this course get to know the structure, tuning and playing technique of Instruments.</li> <li>2. The students will develop confidence to perform a raga for a long duration of time.</li> <li>3. The students will be able to play A Gat in Chautaal (Dhrupad Style) with and in- depth knowledge of its style of performance.</li> </ol>
<b>Course Learning Outcome MAIN – 554</b> <b>(Practical; Viva- VOCE)</b>	<ol style="list-style-type: none"> <li>1. The students will be able to demonstrate how to separate similar sounding ragas.</li> <li>2. The students will be able to explain the grammatical rules of a raga in detail.</li> <li>3. Basic knowledge about accompaniment with vocal &amp; Instrumental music in different taalās.</li> </ol>
<b>Semester 4<sup>th</sup></b>	
<b>Course Learning Outcome MAIN - 571</b> <b>(History of Indian Music) Part- 2</b>	<ol style="list-style-type: none"> <li>1. Acquire the historical and comparative knowledge of Ragas of Gurmat Sangeet.</li> <li>2. Acquire the knowledge of evolution of percussion Instruments.</li> <li>3. Student will be able to write composition in Staff Notation System.</li> <li>4. Student will be able to calculate 484 Ragas from one That.</li> <li>5. Acquire the knowledge of concept of time theory of Indian Music and Terminology for the Musician used in Ancient Granth.</li> </ol>
<b>Course Learning Outcome MAIN – 572</b> <b>(A Critical Study of Gurmat Sangeet) Part -2</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of Chaounki Parampara and Gurmat Sangeet.</li> <li>2. Acquire the knowledge the knowledge of different Gyan Shellies of Gurmat Sangeet.</li> <li>3. Understanding the contribution of Rababies in Gurmat Sangeet.</li> </ol>

	4. Student will be able to develop and understanding towards the qualities of Kirtania.
<b>Course Learning Outcome MAIN – 573 (Practical- Staze Performance)</b>	<ol style="list-style-type: none"> <li>1. The students of this course get to know the structure, tuning and playing technique of Instruments.</li> <li>2. The students will develop confidence to perform a arrag for a long duration of time.</li> <li>3. The students will be able to play A Gat in Chautaal (Dhrupad Style) with and in- depth knowledge of its style of performance.</li> </ol>
<b>Course Learning Outcome MAIN – 574 (Practical; Viva- VOCE)</b>	<ol style="list-style-type: none"> <li>1. The students will be able to demonstrate how to separate similar sounding ragas.</li> <li>2. The students will be able to explain the grammatical rules of a raga in detail.</li> <li>3. Basic knowledge about accompaniment with vocal &amp; Instrumental music in different taalās.</li> </ol>
<b>Course Learning Outcome MAIN – 600 (Project)</b>	<ol style="list-style-type: none"> <li>1. Student will be able to draft a project related to Indian Classical Music focusing either on practical or theoretical aspects thereby developing and analytical approach and aptitude toward research for higher studies.</li> </ol>

<b>M.A (Vocal)</b>	
<b>Program outcome</b>	<p>To be able attain expertise in the discipline and pursue Higher education</p> <p>To be able to pursue career in the discipline as professional performer</p> <p>To be able to employed as school teacher at PGT level in the discipline</p> <p>To be able to collaborate with musician of other genres in fusion bands as performer</p> <p>To develop as musicologist</p> <p>To be able to develop as entrepreneur by capitalizing self-employment opportunities</p>
<b>Program specific outcome</b>	<p>To be able to perform Hindustani classical vocal recital in traditional manner</p> <p>To be able to perform various Gaayan shilpis of Hindustani classical music</p> <p>To be able to present elaborations of ragas in different taals</p> <p>To acquire the knowledge of History of Indian music, its practical &amp; theoretical concepts and aesthetical relevance</p> <p>To be able to acquire the practical and conceptual knowledge of Gurmat Sangeet</p>
<b>Sem: I</b>	
<b>General and Applied Theory of Indian Classical Music,</b>  <b>(Part - 1) MAVO-521</b>	<p>I: Acquire the knowledge of Historical and comparative study of prescribed ragas.</p> <p>II: Students will be able to write notations of compositions in vilambit khayal and in drut khayal (other than Teen Taal) in the prescribed ragas</p> <p>III: Being aware of Tanpura and Sahayak Naad.</p> <p>IV: Acquire the knowledge of Nibadh and Anibadh Gayan (From ancient to modern time).</p> <p>V: Acquire the practical aspect of Taal and Laykaries like aadh , kuaad and biaad.</p>



	<p>VI: Being aware of Principles of Stage-Performance.</p> <p>VII: Being aware of differences and similarities of Karnataki and Hindustani Music with special reference to Swar, Raag and Taal.</p>
<p><b>Aesthetical study of Indian Music (Part -1) MAV0-522</b></p>	<p>I: Acquire the knowledge of the principles of Aesthetics in the context of music.</p> <p>II: Acquire the concepts of Harmony and Melody and its applications in music.</p> <p>III: Being aware of Evolution of notation system, its merits and demerits.</p> <p>IV: Acquire the knowledge of the concept of <i>Gram</i></p> <p>V: Being aware of The influence of aesthetical elements in music performances.</p> <p>VI: Understanding the concepts of Raag and Rasa &amp; Music and Fine Arts.</p>
<p><b>Stage Performance (MAVO-523)</b></p>	<p>I: Student will be able to tune Tanpura.</p> <p>II : Student will be able to demonstrate one raag with Vilambit Khayal, Drut Khayal and Tarana.</p> <p>III: Student will be able to compose shabads / bhajans, in Keherva Taal and in Dadra Taal .</p> <p>IV: Student will have the exposure to perform in front of the audiences.</p>
<p><b>Practical Viva-Voce MAVO- 524</b></p>	<p>I: Student will be able to acquire Detailed and analytical Knowledge of Ragas for viva-voce.</p> <p>II: Student will be able to present Vilambit Khayal with Drut Khayal and Chaturang / Trivat.</p> <p>III: Student will be able to present Drut khayal with Gayaki.</p> <p>IV: Student will learn the singing style of Jhaptaal.</p> <p>V: Student will be able to present the comparative study of ragas with practical elaborations.</p>
<p><b>Sem : II</b></p>	
<p><b>General and Applied Theory of Indian Classical Music</b></p>	<p>I: Students will acquire Historical and comparative knowledge of the prescribed ragas</p>

<p><b>(Part - 2) MAVO - 531</b></p>	<p>II: Students will be able to compose and write the poetry in Drut Khayal pattern</p> <p>III: Acquire the knowledge of Principles of musical composition in Indian Music.</p> <p>IV: Acquire the knowledge of Devotional aspect of music.</p> <p>V: Students will acquire the knowledge of <i>Gharana System</i> with special reference to <i>Khayal Gayaki</i>.</p> <p>VI: Students will understand the aesthetical significance and social relevance of the art form in present era</p> <p>VII: Acquire the knowledge of Principles of <i>Alap</i> and <i>Taan</i>.</p>
<p><b>Aesthetical study of Indian Music,</b> <b>(Part – 2) MAVO-532</b></p>	<p>I: Acquire the knowledge of Concept of Raag-Dhayan -Chitra.</p> <p>II: Student will be able to understand the aesthetical terms: Meend, Gamak, Khatka, Murki, Kan-Swar and Avirbhava-Tirobhava in detail with historical reference.</p> <p>III: Understand the theoretical aspect of Gayaki and its elements.</p> <p>IV: Acquire the knowledge of acoustical terms and its scientific law.</p> <p>V: Understanding the concept of raag-mishran.</p> <p>VI: Understanding the relation of Raag with season and time.</p>
<p><b>Stage performance</b> <b>MAVO - 533</b></p>	<p>I: Student will be able to demonstrate one raag with Vilambit Khayal, Drut Khayal and Tarana.</p> <p>II: Student will be able to compose shabads/bhajans, in rupak and Deepchandi Taal.</p> <p>III: Student will have the exposure to perform in front of the audiences.</p> <p>IV: Students will be able to present a composition in Dhamar style with laykaris.</p>
<p><b>Practical Viva Voce</b> <b>MAVO - 534</b></p>	<p>I: Student will be able to acquire Detailed and analytical Knowledge of Ragas for viva-voce.</p> <p>II: student will be able to present Vilambit Khayal with Drut Khayal and Chaturang / Trivat.</p> <p>III: Student will be able to present Drut khayal with Gayaki.</p> <p>IV: Student will learn the singing style of Ektaal.</p> <p>V: Student will be able to present the comparative study of ragas with practical elaborations.</p>
<p align="center"><b>Sem – III</b></p>	

<b>History of Indian Music, (Part - 1) MAVO- 551</b>	<p>I: Acquire the historical and comparative knowledge of the prescribed ragas.</p> <p>II: Acquire the knowledge of Indian Music in Vedic period , Hindu period , Muslim period , British period and Post-Independence era.</p> <p>III: Acquire the knowledge of development of Musical Scales of Indian Music</p> <p>IV: Obtain the differences of Shruti- Swar distribution in Ancient, Medieval and in Present time student will be able to analyze the contribution of the great female Vocalist and Instrumentalist.</p> <p>V: Students will be have insight to important treatises of Ancient and medieval period Being aware of history of harmonium and its implications in Indian classical music.</p> <p>VI: Understand the concept of of Moorchhna.</p>
<b>A critical study of Gurmat Sangeet (Part - 1) MAVO-552</b>	<p>I: Acquire the historical and comparative knowledge of the prescribed ragas Acquire the knowledge of origin and development of <i>Gurmat sangeet</i>.</p> <p>II: Student will be able to understand the objectives, singing style , theoretical concepts and other differences of <i>Gurmat Sangeet</i> and <i>Hindustani Music</i>.</p> <p>III: Student will be able to analyze the significance of String Instruments in Gurmat Sangeet.</p> <p>IV: Student will be able to explain the importance of Music in <i>Sri Guru Granth Sahib</i> and understand the salient features of <i>Gurmat Sangeet</i>.</p> <p>V: Students will be able to analyze the <i>Raagas</i> of <i>Gurmat Sangeet</i> which are based on Folk Music.</p>
<b>Stage performance MAVO- 553</b>	<p>I: Student will be able to tune Tanpura.</p> <p>II: Student will be able to demonstrate one raag with Manglacharan in <i>Vilambit Khayal style</i> , <i>Shabad in Drut Khayal style</i> and <i>Padhtaal</i>.</p> <p>III: Students will be able to present Dhrupad with different laykaris in traditional style.</p> <p>IV: Student will have the exposure of stage performance.</p>
<b>Practical Viva-voce</b>	<p>I: Student will be able to acquire Detailed and analytical Knowledge of Ragas of Gurmat Sangeet tradition for viva-voce.</p> <p>II: student will be able to present e<i>Vilambit Khayal</i> with <i>Drut Khayal</i> and <i>Chaturang/ Trivat</i>.</p> <p>III: Student will be able to present Drut khayal with Gayaki.</p>

<p><b>MAVO 554</b></p>	<p>IV: Student will learn the singing style of Rupak taal with all elements of Gayaki.</p> <p>V: Student will be able to present the comparative study of ragas with practical elaborations.</p>
<p style="text-align: center;"><b>Sem : IV</b></p>	
<p><b>History of Indian Music</b> <b>(Part - 2)</b> <b>MAVO 571</b></p>	<p>I: Acquire the historical and comparative knowledge of the prescribed ragas.</p> <p>II: Student will be able to understand the phenomena of development of Raag-Classification system from ancient to present time.</p> <p>III: Student will be able to write composition in staff notation.</p> <p>IV: Acquire the theory of evolution and development of percussion instruments.</p> <p>V: Student will be acquainted of methodology of Thesis writing</p> <p>VI: Student will be able to calculate 484 Ragas from one Thaata.</p> <p>VII: Acquire the detailed knowledge of Time theory of Ragas.</p> <p>VIII: Being aware of ancient terminology describing features of musician from Indian perspective.</p>
<p><b>A Critical Study of Gurmat Sangeet,</b> <b>( Part - 2) MAVO - 572</b></p>	<p>I: Acquire the historical and comparative knowledge of the prescribed ragas of Gurmat Sangeet</p> <p>II: Acquire the knowledge of Ragas with reference to <i>Shri Guru Granth Sahib</i>.</p> <p>III: Student will be able to explain the Contribution of <i>Rababi Musician</i> in the field of <i>Gurmat Sangeet</i>.</p> <p>IV: <i>Being aware of the 'Chownki Parampara' of Gurmat Sangeet.</i></p> <p>V: Understand the qualities of good <i>Keertania</i>.</p> <p>VI: Acquire the knowledge of different <i>Gayan Shellies of Gurmat Sangeet</i>.</p> <p>VII: Will understand the commonalities of Ragas of Gurmat sangeet and Indian classical music.</p>
<p><b>Stage performance</b> <b>MAVO- 573</b></p>	<p>I: Student will be able to tune Tanpura.</p> <p>II: Student will be able to demonstrate one raag with manglacharan in <i>Vilambit Khayal style</i> , <i>Shabad in Drut Khayal style</i> and <i>Padhtaal</i> .</p>

	<p>III: Student will be able to perform Rag Mala or Guldasta .</p> <p>IV: Student will have the exposure to perform in front of the audiences.</p>
<p><b>Practical Viva Voce</b></p> <p><b>MAVO- 574</b></p>	<p>I: Student will be able to acquire Detailed and analytical Knowledge of Ragas pf Gurmat Sangeet for viva-voce.</p> <p>II: Student will be able to present <i>Vilambit Khayal</i> with <i>Drut Khayal</i> and tarana.</p> <p>III: Student will be able to sing <i>Chaturang/ Trivat</i> with its <i>gayaki</i> style.</p> <p>IV: Student will be able to present Drut khayal with Gayaki.</p> <p>V: Student will learn the singing style of Ada chautaal.</p> <p>VI: Student will be able to present the comparative study of ragas with practical elaborations.</p>

## PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES

### M.A. (Hons.) PUNJABI

<b>Program Outcome</b>	<p>1. To be able and capable of holding various posts of Assistant Professor in government and semi-government Colleges/ Universities of Punjab, Haryana, Chandigarh, Delhi and Rajasthan.</p> <p>2. Opportunities for projects by various Government and funded agencies in the field of culture and folklore in context of Punjab and Himachal Pradesh such as Indian Institute of advanced Study Shimla (IIAS).</p> <p>3. Eligibility for the posts of Principal and Lecturer of Various Government schools in Punjab, Haryana and Chandigarh.</p> <p>4. Eligibility for a number of PDF research opportunities under UGC and MHRD after completing Ph.D.</p> <p>5. Unlimited potential in print media and electronic media, such as newspaper editors, news readers and anchors on Television and as will as Radio broadcasting.</p>
<b>Program Specific Outcome</b>	Being able to get special information about medieval Gurmat Poetry (Gurbani) by having honors in Gurmat Subject.
<b>Course: M.A. (Hons.) Punjabi</b>	<b>Outcomes</b>
<b>ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਇਤਿਹਾਸਕਾਰੀ - I (8ਵੀਂ ਸਦੀ – 1850 ਈ.)</b>	ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਮੁੱਢਲੀ ਇਤਿਹਾਸਕਾਰੀ ਬਾਰੇ ਜਾਣੂ ਹੋਣਾ
<b>ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਖੋਜ – ਵਿਧੀ</b>	ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਦੇ ਮੁੱਢ, ਨਿਕਾਸ ਅਤੇ ਵਿਕਾਸ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਖੋਜ-ਵਿਧੀ ਦੀਆਂ ਤਕਨੀਕਾਂ ਤੋਂ ਜਾਣੂ ਹੋਣਾ ਤਾਂ ਕਿ ਭਵਿੱਖ ਵਿਚ ਖੋਜ ਕਰਨ ਸਮੇਂ ਇਸਦੀ ਵਰਤੋਂ ਕੀਤੀ ਜਾ ਸਕੇ
<b>ਪੰਜਾਬੀ ਵਾਰਤਕ</b>	ਮੁੱਢਲੀ ਵਾਰਤਕ ਤੋਂ ਲੈ ਕੇ ਆਧੁਨਿਕ ਵਾਰਤਕ ਦੇ ਸਾਰੇ ਰੂਪਾਕਾਰਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਤਿੰਨ ਵਾਰਤਕ ਪੁਸਤਕਾਂ (ਪੁਰਾਤਨ ਜਨਮ ਸਾਖੀ-ਭਾਈ ਵੀਰ ਸਿੰਘ, ਮੇਰਾ ਪਿੰਡ- ਗਿਆਨੀ ਗੁਰਦਿੱਤ ਸਿੰਘ, ਰੰਗਾਂ ਦੀ ਗਾਗਰ- ਸਰਦਾਰਾ ਸਿੰਘ ਜੌਹਲ) ਬਾਰੇ

	ਆਲੋਚਨਾਤਮਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ
ਲੋਕਧਾਰਾ ਅਤੇ ਪੰਜਾਬੀ ਸਭਿਆਚਾਰ	ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦੀ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਦੇ ਨਾਲ-ਨਾਲ ਬੁਨਿਆਦੀ ਸੰਕਲਪਾਂ ਨੂੰ ਸਮਝਣ ਉਪਰੰਤ ਪੰਜਾਬ ਅਤੇ ਹਿਮਾਚਲ ਦੀ ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦੇ ਤੁਲਨਾਤਮਕ ਅਧਿਐਨ ਸਬੰਧੀ ਸਮਰੱਥਾ ਪੈਦਾ ਕਰਨਾ
ਭਾਸ਼ਾ ਅਤੇ ਭਾਸ਼ਾ-ਵਿਗਿਆਨ	ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਦੇ ਸੰਕਲਪਾਂ ਅਤੇ ਵਿਧੀਆਂ ਨੂੰ ਸਮਝਦਿਆਂ ਹੋਇਆ ਪੂਰਬੀ ਅਤੇ ਪੱਛਮੀ ਸੰਕਲਪਾਂ ਸਬੰਧੀ ਸਮਝ ਪੈਦਾ ਕਰਨੀ
ਗੁਰਮਤਿ ਕਾਵਿ - I (ਗੁਰੂ ਨਾਨਕ ਬਾਣੀ ਵਿਸ਼ੇਸ਼ ਅਧਿਐਨ)	ਗੁਰਮਤਿ ਕਾਵਿ ਦੀ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਦੇਣ ਦੇ ਨਾਲ-ਨਾਲ ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ ਦੀਆਂ ਤਿੰਨ ਬਾਣੀਆਂ ਜਪੁਜੀ ਸਾਹਿਬ, ਆਸਾ ਦੀ ਵਾਰ ਅਤੇ ਬਾਰਾਂਮਾਹ ਤੁਖਾਰੀ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਇਤਿਹਾਸਕਾਰੀ - II (1851ਈ. – ਹੁਣ ਤੱਕ)	ਆਧੁਨਿਕ ਕਾਲ ਤੋਂ ਲੈ ਕੇ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਸੰਯੁਕਤ ਇਤਿਹਾਸਕਾਰੀ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨਾ
ਪੰਜਾਬੀ ਕਿੱਸਾ ਕਾਵਿ	ਪੰਜਾਬੀ ਕਿੱਸਾ ਕਾਵਿ ਦੇ ਇਤਿਹਾਸ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਪ੍ਰਮੁੱਖ ਤਿੰਨ ਕਿੱਸਿਆਂ (ਹੀਰ-ਵਾਰਿਸ ਸ਼ਾਹ, ਪੂਰਨ ਭਗਤ-ਕਾਦਰਯਾਰ ਅਤੇ ਸੱਸੀ ਪੁੰਨੂ) ਬਾਰੇ ਆਲੋਚਨਾਤਮਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ
ਭਾਰਤੀ ਅਤੇ ਪੱਛਮੀ ਸਾਹਿਤ ਸਿਧਾਂਤ	ਭਾਰਤੀ ਅਤੇ ਪੱਛਮੀ ਸਾਹਿਤ ਸਿਧਾਂਤਾਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ ਪੰਜਾਬੀ ਆਲੋਚਨਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ
ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ	ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਆਧੁਨਿਕ ਕਵਿਤਾ ਦੀਆਂ ਤਿੰਨ ਪਾਠ-ਪੁਸਤਕਾਂ (ਹਾਸੀਏ ਦੇ ਹਾਸਿਲ-ਡਾ. ਰਾਜਿੰਦਰ ਪਾਲ ਸਿੰਘ ਬਰਾੜ (ਸੰਪਾ.), ਲਹਿਰ ਹੁਲਾਰੇ – ਭਾਈ ਵੀਰ ਸਿੰਘ ਅਤੇ ਸੁਰਜਮੀਨ-ਸੁਰਜੀਤ ਪਾਤਰ) ਬਾਰੇ ਆਲੋਚਨਾਤਮਿਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ
ਪੰਜਾਬੀ ਸੂਫੀ ਕਾਵਿ	ਪੰਜਾਬੀ ਸੂਫੀ ਕਵਿਤਾ ਦੇ ਇਤਿਹਾਸ ਦੇ ਹਵਾਲੇ ਨਾਲ ਬਾਬਾ ਫ਼ਰੀਦ, ਸ਼ਾਹ ਹੁਸੈਨ ਅਤੇ ਸੁਲਤਾਨ ਬਾਹੂ ਦੇ ਕਲਾਮ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
ਗੁਰਮਤਿ ਕਾਵਿ - II	ਗੁਰਮਤਿ ਕਾਵਿ ਦੇ ਇਤਿਹਾਸਿਕ ਪਰਿਪੇਖ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਅਨੰਦ ਸਾਹਿਬ-ਗੁਰੂ ਅਮਰਦਾਸ, ਸਲੋਕ ਮਹਲਾ ਨੈਵਾਂ- ਗੁਰੂ ਤੇਗ ਬਹਾਦਰ ਜੀ ਅਤੇ ਭਾਈ ਗੁਰਦਾਸ ਦੀ ਪਹਿਲੀ ਵਾਰ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
ਪੰਜਾਬੀ ਕਹਾਣੀ	ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਤਿੰਨ ਪਾਠ ਪੁਸਤਕਾਂ (ਮੇਰੀਆਂ ਸ਼੍ਰੇਸ਼ਟ ਕਹਾਣੀਆਂ-ਕੁਲਵੰਤ ਸਿੰਘ



	ਵਿਰਕ, ਚਾਦਰ ਹੇਠਲਾ ਬੰਦਾ-ਸੁਖਵੰਤ ਕੌਰ ਮਾਨ ਅਤੇ ਆਹਟ-ਬਲਦੇਵ ਸਿੰਘ ਧਾਲੀਵਾਲ (ਸੰਪਾ.) ਦਾ ਆਲੋਚਨਾਤਮਿਕ ਅਧਿਐਨ ਕਰਨਾ।
<b>ਪੰਜਾਬੀ ਆਲੋਚਨਾ</b>	ਪੰਜਾਬੀ ਆਲੋਚਨਾ ਦਾ ਸਿਧਾਂਤ ਅਤੇ ਇਤਿਹਾਸ ਜਾਨਣ ਉਪਰੰਤ ਤਿੰਨ ਪਾਠ ਪੁਸਤਕਾਂ (ਸਾਹਿਤਾਰਥ-ਸੰਤ ਸਿੰਘ ਸੇਖੋਂ, ਕਾਵਿ ਅਧਿਐਨ-ਅਤਰ ਸਿੰਘ, ਅਧਿਐਨ ਅਤੇ ਅਧਿਆਪਨ-ਹਰਿਭਜਨ ਸਿੰਘ) ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਪਾਕਿਸਤਾਨੀ ਪੰਜਾਬੀ ਸਾਹਿਤ</b>	ਪਾਕਿਸਤਾਨੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦਾ ਸੰਖੇਪ ਇਤਿਹਾਸ ਜਾਨਣ ਉਪਰੰਤ ਤਿੰਨ ਪਾਠ ਪੁਸਤਕਾਂ (ਦੁਖ ਦਰਿਆਓਂ ਪਾਰ ਕੇ-ਅਤਰ ਸਿੰਘ ਅਤੇ ਡਾ, ਜਗਤਾਰ, ਚੇਣਵਾਂ ਪਾਕਿਸਤਾਨੀ ਪੰਜਾਬੀ ਨਾਟਕ-ਡਾ. ਸਤੀਸ਼ ਕੁਮਾਰ ਵਰਮਾ ਅਤੇ ਡਾ, ਨਸੀਬ ਬਵੇਜਾ, ਪਾਕਿਸਤਾਨੀ ਪੰਜਾਬੀ ਕਹਾਣੀ-ਡਾ. ਸ਼ਹੀਨ ਮਲਿਕ) ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਗੁਰਮਤਿ ਕਾਵਿ - III</b>	ਗੁਰਮਤਿ ਕਾਵਿ ਦੀਆਂ ਰੂਪਾਕਾਰਕ ਵੰਨਗੀਆਂ ਦੱਸਣ ਦੇ ਨਾਲ-ਨਾਲ ਸੁਖਮਨੀ ਸਾਹਿਬ-ਗੁਰੂ ਅਰਜਨ ਦੇਵ, ਬਾਰਾਂਮਾਹ ਮਾਝ-ਗੁਰੂ ਅਰਜਨ ਦੇਵ, ਜਾਪੁ ਸਾਹਿਬ-ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਆਪਸ਼ਨ ਪਹਿਲੀ – ਪੰਜਾਬੀ ਨਾਟਕ</b>	ਪੰਜਾਬੀ ਨਾਟਕ ਦਾ ਇਤਿਹਾਸ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ ਦੱਸਣ ਉਪਰੰਤ ਤਿੰਨ ਨਾਟਕਾਂ (ਗਗਨ ਮੈਂ ਥਾਲ-ਬਲਵੰਤ ਗਾਰਗੀ, ਇਸ਼ਕ ਬਾਝ ਨਮਾਜ ਦਾ ਹੱਜ ਨਾਹੀਂ-ਅਜਮੇਰ ਐਲਖ, ਸ਼ਾਇਰੀ-ਸਵਰਾਜਬੀਰ) ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਪਰਵਾਸੀ ਪੰਜਾਬੀ ਸਾਹਿਤ</b>	ਪਰਵਾਸੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਬਾਰੇ ਸਿਧਾਂਤਕ ਅਤੇ ਇਤਿਹਾਸਕ ਜਾਣਕਾਰੀ ਉਪਰੰਤ ਤਿੰਨ ਪਾਠ ਪੁਸਤਕਾਂ (ਵਰਤਮਾਨ ਦੇ ਆਰ-ਪਾਰ-ਦਰਸ਼ਨ ਬੁਲੰਦਵੀ (ਸੰਪਾ.), ਦਿੱਸਹੱਦਿਆਂ ਦੇ ਆਰ-ਪਾਰ-ਹਰਿਭਜਨ ਸਿੰਘ (ਸੰਪਾ.), ਡੌਂਗੀਟੇਲ ਡਰਾਈਵ-ਇਕਬਾਲ ਮਾਹਲ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਗੁਰਮਤਿ ਕਾਵਿ – IV (ਭਗਤ ਬਾਣੀ ਵਿਸ਼ੇਸ਼ ਅਧਿਐਨ)</b>	ਗੁਰਮਤਿ ਕਾਵਿ ਦੀਆਂ ਪ੍ਰਵਿਰਤੀਆਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਉਪਰੰਤ ਭਗਤ ਕਬੀਰ, ਭਗਤ ਨਾਮਦੇਵ ਅਤੇ ਭਗਤ ਰਵਿਦਾਸ ਦੀ ਬਾਣੀ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
<b>ਆਪਸ਼ਨ ਪਹਿਲੀ – ਪੰਜਾਬੀ ਨਾਵਲ</b>	ਪੰਜਾਬੀ ਨਾਵਲ ਦੇ ਸਿਧਾਂਤ , ਇਤਿਹਾਸ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਉਪਰੰਤ ਤਿੰਨ ਨਾਵਲਾਂ (ਤੂਤਾਂ ਵਾਲਾ ਖੂਹ-ਸੋਹਣ ਸਿੰਘ ਸੀਤਲ, ਤੀਨ ਲੋਕ ਸੇ ਨਿਆਰੀ-ਦਲੀਪ ਕੌਰ ਟਿਵਾਣਾ, ਯੁੱਧਨਾਦ-ਮਨਮੋਹਨ ਬਾਵਾ) ਦਾ ਅਧਿਐਨ ਕਰਨਾ

## **M.Sc. Psychology**

### **PROGRAMME OUTCOMES**

- Advanced knowledge regarding key theories and methods in psychology.
- In-depth understanding of application of Psychological principles in different behavioural contexts.
- Knowledge and use of research methods and statistics in psychology.
- Ability to appraise the efficacy of different interventions to promote psychological well-being and performance.
- Translation of theory into professional practice and applied research.
- Application of psychological research methods to a novel research topic.
- Planning and execution of an original piece of research.
- Ability to identify and address ethical and professional issues in psychology.
- Developing professional attitude and expertise in the field of psychology.
- Development of independent and flexible approach to effective learning.

### **PROGRAMME SPECIFIC OUTCOMES**

- Student will be able to explain various theories and utilization of their principles in day to life activities
- Student will be able to conduct research on different issues
- Students will be able to apply the statistical analysis to study the research issues
- Student will be able to provide psychological interventions by learning the principles of counselling and health psychology
- Students will be able to develop a professional aptitude in their behavioral outcomes

### **COURSE OUTCOMES**

<b>Semester</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>I</b>	<b>PSYM 501</b>	<b>Principles of Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

- Develop a working knowledge of Psychological contents, areas and applications of psychology.
- Develop a base in cognitive psychology with the help of relevant examples of everyday life.
- Comprehend and analyse situations in real life appropriately and enable others to exercise in the same way.
- Appreciate and apply various theories of learning in the practical world.
- Identify the importance of experiments in the field of memory and other cognitive aspects and analyse the way it shaped cognitive psychology

<b>PSYM 502</b>	<b>Psychology of Life Span Development</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Understand basic concepts, issues and debates in the field of developmental psychology.
- Appreciate principal theories of lifespan development.
- Comprehend human development as progressing through different stages.

- Discuss development from the perspective of different domains such as physical, motor, cognitive, and psychosocial.
- Understand the role of family, peers and community in influencing development at
- different stages.

<b>PSYM 503</b>	<b>Research Methods in Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- On completion of the course the student will be able to understand, participate and conduct various steps involved in research.
- Differential understanding of appropriate techniques to be used in various types of scientific research in social sciences.
- Analyse & comprehend research and its application.
- Design and Develop the strategy, to conduct research.
- Comprehend the inter relation between parameters under study.
- Develop insight into procedural scientific steps of conducting a research.

<b>PSYM 504</b>	<b>Advanced Social Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Develop insight and analyze the contribution of social psychologists to the understanding of human society.
- Evaluate effective strategies in socialization, group processes (both inter and intra-group) and helping behavior.
- Ability to register the progression of theories in major areas in Social Psychology.
- Interpret attitude formation and various methods to be used to change the attitude.
- Understand aspects related to social psychology

<b>PSYM 505</b>	<b>Practicum 1</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Ability to administer, analyze and interpret results from various psychological tools.
- Expanded knowledge of various assessment procedures
- Learning regarding conduction of experiments

<b>Semester</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
<b>II</b>	<b>PSYM 521</b>	<b>Cognitive Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>

**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Getting theoretically and practically focused on concepts of attention, perception, memory, learning, thinking, concept formation, language formation.
- Analyze each situation rationally and take decisions better and faster than others.
- Comprehend the role of mental processing in day -to- day life for solving problems.
- Identify the building blocks that enable students to identify their strengths and weaknesses so that they can further help others in doing so
- Cultivate cognitive skills to understand the mind and behavior.
- Explore and comprehend the concepts, principles and themes of cognitive psychology.
- Facilitate the students to develop the cognitive skills in themselves and others.

<b>PSYM 522</b>	<b>Personality Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Illustrate various theories of personality.
- Develop capability to apply knowledge of personality theories for self and societal growth
- It enables students to become familiar with the major theories and traditions related to the study of personality and personal growth.
- It further enables the student to articulate the underlined themes, methodology and assumption of each theory to enhance understanding of personality and behaviour.

<b>PSYM 523</b>	<b>Counselling and Guidance</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Evaluate various psychotherapies and schools in counselling techniques.
- Develop skills of eclectic therapeutic plans.
- Identify the techniques to practice in the therapy encounter and how those techniques should be implemented with a variety of disorders and psychosocial issues

<b>PSYM 524</b>	<b>Qualitative Research methods</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- To enable students to understand the concepts and methodology for its application in research work and human behaviour.
- Students will be able to apply psychometric methods in psychological testing.

<b>PSYM 525</b>	<b>Practicum 2</b>	<b>0</b>	<b>0</b>	<b>2</b>	<b>2</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Ability to administer, analyse and interpret results from various psychological tools.
- Expand knowledge of various assessment procedures
- Knowledge of the ways to interpret the scores obtained through experiments and learn to discover the difference in between experimental and non- experimental set-up

<b>Semester</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
III	<b>PSYM 601</b>	Organizational Behavior, Development and Change	4	0	0	4

**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Students will be able to describe concepts of psychology in the process of manpower training.
- Design training & development process of an organizations, apply various methods in organizational setting
- The goal of this course is to understand how psychological principal improve efficiency and quality of employee life
- Students gain knowledge about the history of I/O psychology, job analysis, motivation, leadership, job satisfaction, work stress and health.

<b>PSYM 602</b>	<b>Clinical Psychology</b>			
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Express the nature and scope of clinical psychology and its linkages to other fields of healthcare and management

- Analyze the current state of clinical psychology in India vis-à-vis the west
- Develop insight various categories of psychological disorders with an emphasis on diagnosis and prognosis
- Illustrate and analyze the ethical issues in clinical practice.
- Identify and inculcate the skills to become a professional in the field of clinical psychology
- Provide students with opportunities to apply the concepts learnt in the class-room to real-life situations
- Enable students to understand Research and its importance in experiential learning through Case study.

<b>PSYM 603</b>	<b>Quantitative Techniques for Psychology</b>			
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Analyse the basic concepts of statistics in psychology
- Description and communication of data through advanced methods
- Explore parametric and non- parametric statistical tools for analysis and interpretation
- Illustrate hypothesis testing by use of inferential tools
- Apply qualitative data analysis for in depth explorations

<b>PSYM 604</b>	<b>Neuropsychology</b>			
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Describe the nature and basic principles of neuropsychology.
- Identify the brain's levels and structures and summarize the functions of its parts.
- Plan and Execute assessments and rehabilitation for individuals with neurocognitive dysfunctions
- Understand the complexities associated with the nervous system and its command centre – the brain.
- To equip students with skills to consider and rule out a neuropsychological origin of the psychopathology

<b>PSYM 606</b>	<b>Practicum 3</b>	0	0	2	2

**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Ability to administer, analyse and interpret results from various psychological tests i.e. personality, intelligence sociometric data etc.
- Expanded knowledge of various assessment procedures
- Also make them learn to qualitatively and quantitatively analyse the data and interpret the scores obtained.
- Enables students to learn the importance of psychological testing and the types of tests used.

<b>Semester</b>	<b>Course Code</b>	<b>Course Title</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>C</b>
IV	<b>PSYM 621</b>	Indigenous Psychology	4	0	0	4

**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Review historical components as it relates to the current health and wellbeing of Indigenous people.
- Understand the unique challenges faced by Indigenous populations in achieving equitable outcomes.
- Gain an improved level of cultural competency and reflexivity in working with Indigenous people.
- Understand how psychological research can inform practice with Indigenous people.

<b>PSYM 622</b>	<b>Health Psychology</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Analyzing Historical perspective on Health & Illness
- Introduction on how theoretical and empirical findings are applied to improve the lives and development of individuals and groups with the help of health psychology.
- Analyze and critically evaluating fundamental issues, with a particular focus on how to promote health across a range of settings this course will be relevant for students who want to work in health settings.
- The course will provide an insight into how psychology can be used to understand important health issues for example – patient adjustment to chronic illness, how to motivate patients to change their health-related behaviour or how lifespan influences shape our health beliefs and behaviours, arguments, and points of view in health psychology

<b>PSYM 624</b>	<b>Therapeutic Techniques</b>	<b>4</b>	<b>0</b>	<b>0</b>	<b>4</b>
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**Course Objectives and Learning Outcomes:** At the end of the course, students will be able to:

- Analyze and apply their understanding of psychological testing.
- Interpret and assess the role of psychological testing in various settings.
- Effectively synthesize and apply the variations in scales and tests.
- Recognize the various types of psychological tests
- Organize the various steps in construction of a psychological test
- Review the ethical issues surrounding psychometric evaluation in day to day life
- On completion of this course the student should be able to appraise testing in psychology.
- Apply psychological testing, and various tests to assess intelligence and personality.
- Demonstrate ways to measure personality and various scales and tests that are used for the purpose.

## Program Outcomes, Program Specific Outcomes & Course Outcomes of Ph.D. English

<b>Program Outcomes</b>	<b>Ph.D. (English) Program</b>
PO1.	Students can understand the concepts and methods of research.
PO2.	Students are able to develop research proposal and can work with problems.
PO3.	Students learn to use various research methods for their research work.
PO4.	Students can come to certain conclusion after completing the research work.
PO5.	Students can continue their research work for further or post-doctoral research.
<b>Program Specific Outcomes</b>	<b>PSOs of Ph.D. (English) Program</b>
PSO1.	After completion of Ph.D. program the Research Scholar will know how to choose the problem for research in literature and language area.
PSO2.	Understand the concepts of research fundamentals and methodology.
PSO3.	He will guide further to make comparative and contrastive analysis of English language and literature with other languages and literature in other languages.
PSO4.	Ph.D. holders in English are respected for their scholarly contribution in English.
PSO5.	Researchers in English can get job of an English teacher/lecturer anywhere in the world.
<b>Course Outcomes</b>	<b>Outcomes</b>
<b>Indian Writing in English ENG 602</b>	CO I: To provide an overview of the various phases of the evolution of Indian writing in English. CO II: To introduce students to the thematic concerns, genres and trends of Indian writing in English. CO III: To understand the genre of Indian Writings in English. CO IV: To gain insight into “Indianness” through representative works. CO V: To identify the relationship between Indian Writing in English and its social context and able to respond to Indian texts critically
<b>Contemporary World Literature (Fiction and Non-Fiction) ENG 605</b>	CO I: To critically analyze world literary texts in the light of several movements in literature. CO II: To analyse literary texts through the perspective of Gender CO III: To know some of the developments, themes and narrative strategies of the works by different authors



**Program Outcomes, Program Specific Outcomes & Course Outcomes of  
Ph.D. English**

	CO IV: To analyze works of fiction and drama for plot structure, setting, characterization, theme, and narrative point of view CO V: To develop a comparative perspective to study the texts
<b>Women Writers in English ENG 606</b>	CO I: The students will have an awareness of class, race and gender as social constructs and about how they influence women's lives. CO II: They will be able to explore the plurality of female experiences. CO III: They will be equipped with analytical, critical and creative skills to interrogate the biases in the construction of gender and patriarchal norms CO IV: To learn how and on what grounds women's writings can be considered as a separate genre CO V: They will read and understand canonical texts written by Women writers across different ages

## Ph.D. Music

<b>Programme Outcome</b>	<ol style="list-style-type: none"> <li>1. To be able to employed at college of University level and work as Assistant professor.</li> <li>2. Will be able to work as Music collagist in the discipline of research.</li> <li>3. To pursue carrier as performer choosing research in practical field.</li> <li>4. To be able to work in research project funded by government.</li> <li>5. To work in the field of research and explore the historical, scientific and social political influences of the discipline.</li> </ol>
<b>Programme Specific Outcome</b>	<ol style="list-style-type: none"> <li>1. Student will be acquainted with the methodology of research.</li> <li>2. Student will be able to develop an analytical and critical thinking towards the various aspects of music.</li> <li>3. Student will be able to develop specialization in the subject on the topic chosen.</li> <li>4. Acquire the knowledge of historical aspects of the discipline.</li> <li>5. Acquire the knowledge of various branches of research in the discipline.</li> <li>6. Student will be able to write and draft research papers in the discipline.</li> </ol>
<b>MUS 601 Historical study of Indian Music.</b>	<ol style="list-style-type: none"> <li>1. Acquire the knowledge of Indian Music during Vedic Times.</li> <li>2. Acquire the knowledge of music in the times of Ramayana and Mahabharata.</li> <li>3. Acquire the knowledge of medieval music and understand how the Indian Classical Music System and ragas have evolved to their modern- day avatars.</li> <li>4. Will be acquainted with music forms, musical instruments and musical traditions of the ancient period.</li> <li>5. Will be acquainted with symbols of Indian Musician the Granths of Ancient period.</li> </ol>
<b>MUS 602 Contribution of Scholars of Indian Music and the study of Important <i>Granthas</i> (treatise)</b>	<ol style="list-style-type: none"> <li>1. Students will be acquainted with the knowledge of Sanskrit Granthas of the medieval period.</li> <li>2. Acquire e the knowledge of Svar, Shuriti and Raag , Taal and mela system of Medieval period</li> <li>3. Acquire the knowledge of contribution of scholar's for Indian Music various musician of the Medieval period.</li> <li>4. Acquire the knowledge of contribution of scholar's for Indian Music in the modern period.</li> <li>5. Contribution of Music colleges in the discipline which will further acquaint the students of various branches of discipline.</li> </ol>
<b>MUS – 609 Research Methodology</b>	<ol style="list-style-type: none"> <li>1. The students would learn about various research methods used in research.</li> <li>2. To know how to do survey of literature in specific field and how to write synopsis for research proposal.</li> </ol>

	<ol style="list-style-type: none"> <li>3. To understand research as career; current status and future prospects of a specific research field.</li> <li>4. To learn experimental designs, sampling designs, recording of observation, measurement and scaling techniques.</li> </ol>
<b>MUS – 607 Seminar</b>	<ol style="list-style-type: none"> <li>1. Students will be able to present the synopsis seminar and there by having a exposure as speaker</li> <li>2. Will be able to develop analytical approach to look at the research questions on the spot interrogated by the research committee member</li> <li>3. Will be able to develop a methodological approach for thesis writing as suggested research committee member.</li> </ol>
<b>MUS – 701 Dissertation*</b>	<ol style="list-style-type: none"> <li>1. Students will learn how to work on a research topic assigned to him/her by their supervisor/mentor with a purpose to develop a collective approach to study, analyze and solve the problem.</li> </ol>

## PROGRAM OUTCOMES, PROGRAM SPECIFIC OUTCOMES, COURSE OUTCOMES

### Ph.D. PUNJABI

<b>Program Outcome</b>	<p>1. To be able and capable of holding various posts of Assistant Professor in government and semi-government Colleges/ Universities of Punjab, Haryana, Chandigarh, Delhi and Rajasthan.</p> <p>2. Opportunities for projects by various Government and funded agencies in the field of culture and folklore in context of Punjab and Himachal Pradesh such as Indian Institute of advanced Study Shimla (IIAS).</p> <p>3. Eligibility for the posts of Principal and Lecturer of Various Government Colleges/schools in Punjab, Haryana and Chandigarh.</p> <p>4. Eligibility for a number of PDF research opportunities under UGC and MHRD after completing Ph.D.</p> <p>5. Unlimited potential in print media and electronic media, such as newspaper editors, news readers and anchors on Television and as well as Radio broadcasting.</p>
<b>Program Specific Outcome</b>	Being able to get special information about various aspects of Punjabi Language, Folklore, Art & Culture.
<b>Course: Ph. D. Punjabi</b>	<p><b>Outcomes – ਹੇਠਾਂ ਦਿੱਤੇ ਕੋਰਸਾਂ ਵਿੱਚੋਂ ਪੀਐਚ.ਡੀ. ਦੇ ਕੋਰਸ-ਵਰਕ ਲਈ ਖੋਜਾਰਥੀ ਲਈ ਖੋਜ-ਵਿਧੀ ਅਧਿਐਨ (PBI-609) ਕੋਰਸ ਪੜ੍ਹਨਾ ਲਾਜ਼ਮੀ ਹੈ ਜਦੋਂ ਕਿ ਬਾਕੀ ਆਪਸ਼ਨਾਂ ਵਿੱਚੋਂ ਉਸ ਲਈ ਕੋਈ ਦੇ ਕੋਰਸ ਪੜ੍ਹਨੇ ਲਾਜ਼ਮੀ ਹਨ-</b></p>
<b>ਖੋਜ-ਵਿਧੀ ਅਧਿਐਨ (PBI-609)</b>	<p>ਪੰਜਾਬੀ ਭਾਸ਼ਾ, ਸਾਹਿਤ, ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦੇ ਵਿਭਿੰਨ ਖੇਤਰਾਂ ਵਿੱਚ ਖੋਜ ਕਰਨ ਦੇ ਢੰਗਾਂ ਅਤੇ ਵਿਧੀਆਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਦੇਣ ਦੇ ਨਾਲ-ਨਾਲ ਆਧੁਨਿਕ ਮੀਡੀਆ ਅਤੇ ਇੰਟਰਨੈੱਟ ਨਾਲ ਜੁੜੀ ਖੋਜ ਸਮੱਗਰੀ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨਾ।</p>

ਸਾਹਿਤ ਇਤਿਹਾਸ ਅਤੇ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਇਤਿਹਾਸਕਾਰੀ (PBI-611)	ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਮੁੱਢਲੀ ਇਤਿਹਾਸਕਾਰੀ ਤੋਂ ਲੈ ਕੇ ਆਧੁਨਿਕ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਬਾਰੇ ਜਾਣੂ ਹੋਣਾ , ਆਧੁਨਿਕ ਕਾਲ ਤੋਂ ਲੈ ਕੇ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਸਾਹਿਤ ਦੀ ਸੰਯੁਕਤ ਇਤਿਹਾਸਕਾਰੀ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨਾ
ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ (PBI-612)	ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦੀ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਦੇ ਨਾਲ-ਨਾਲ ਬੁਨਿਆਦੀ ਸੰਕਲਪਾਂ ਨੂੰ ਸਮਝਣ ਉਪਰੰਤ ਪੰਜਾਬ ਅਤੇ ਹਿਮਾਚਲ ਦੀ ਲੋਕਧਾਰਾ ਅਤੇ ਸਭਿਆਚਾਰ ਦੇ ਤੁਲਨਾਤਮਕ ਅਧਿਐਨ ਸਬੰਧੀ ਸਮਰੱਥਾ ਪੈਦਾ ਕਰਨਾ
ਸਾਹਿਤ ਸਿਧਾਂਤ ਅਤੇ ਪੰਜਾਬੀ ਅਲੋਚਨਾ (PBI-613)	ਭਾਰਤੀ ਅਤੇ ਪੱਛਮੀ ਸਾਹਿਤ ਸਿਧਾਂਤਾਂ ਦੇ ਪ੍ਰਸੰਗ ਵਿਚ ਪੰਜਾਬੀ ਅਲੋਚਨਾ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ
ਪੰਜਾਬੀ ਸੂਫੀ ਕਾਵਿ ਧਾਰਾ (PBI-614)	ਪੰਜਾਬੀ ਸੂਫੀ ਕਵਿਤਾ ਦੇ ਇਤਿਹਾਸ ਦੇ ਹਵਾਲੇ ਨਾਲ ਬਾਬਾ ਫ਼ਰੀਦ, ਸ਼ਾਹ ਹੁਸੈਨ, ਬੁੱਲ੍ਹੇ ਸ਼ਾਹ ਅਤੇ ਸੁਲਤਾਨ ਬਾਹੂ ਦੇ ਕਲਾਮ ਦਾ ਵਿਸ਼ਾਗਤ ਅਤੇ ਕਲਾਤਮਕ ਅਧਿਐਨ ਕਰਨਾ
ਗੁਰਮਤਿ ਕਾਵਿ ਧਾਰਾ (PBI-615)	ਗੁਰਮਤਿ ਕਾਵਿ ਦੀ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਦੇਣ ਦੇ ਨਾਲ-ਨਾਲ ਗੁਰੂ ਨਾਨਕ ਦੇਵ ਜੀ ਦੀਆਂ ਤਿੰਨ ਬਾਣੀਆਂ ਜਪੁਜੀ ਸਾਹਿਬ, ਆਸਾ ਦੀ ਵਾਰ ਅਤੇ ਬਾਰਾਂਮਾਹ ਤੁਖਾਰੀ ਦਾ ਅਧਿਐਨ ਕਰਨਾ। ਗੁਰਮਤਿ ਕਾਵਿ ਦੇ ਇਤਿਹਾਸਿਕ ਪਰਿਪੇਖ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਅਨੰਦ ਸਾਹਿਬ-ਗੁਰੂ ਅਮਰਦਾਸ, ਸਲੋਕ ਮਹਲਾ ਨੈਵਾਂ- ਗੁਰੂ ਤੇਗ ਬਹਾਦਰ ਜੀ ਅਤੇ ਭਾਈ ਗੁਰਦਾਸ ਦੀ ਪਹਿਲੀ ਵਾਰ ਦਾ ਅਧਿਐਨ ਕਰਨਾ। ਗੁਰਮਤਿ ਕਾਵਿ ਦੀਆਂ ਰੂਪਾਕਾਰਕ ਵੰਨਗੀਆਂ ਦੱਸਣ ਦੇ ਨਾਲ-ਨਾਲ ਸੁਖਮਨੀ ਸਾਹਿਬ-ਗੁਰੂ ਅਰਜਨ ਦੇਵ, ਬਾਰਾਂਮਾਹ ਮਾਝ-ਗੁਰੂ ਅਰਜਨ ਦੇਵ, ਜਾਪੁ ਸਾਹਿਬ-ਗੁਰੂ ਗੋਬਿੰਦ ਸਿੰਘ ਦਾ ਅਧਿਐਨ ਕਰਨਾ। ਗੁਰਮਤਿ ਕਾਵਿ ਦੀਆਂ ਪ੍ਰਵਿਰਤੀਆਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਉਪਰੰਤ ਭਗਤ ਕਬੀਰ, ਭਗਤ ਨਾਮਦੇਵ ਅਤੇ ਭਗਤ ਰਵਿਦਾਸ ਦੀ ਬਾਣੀ ਦਾ ਅਧਿਐਨ ਕਰਨਾ
ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਾਵਿ (PBI-616)	ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਵਿਤਾ ਬਾਰੇ ਸਿਧਾਂਤਕ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਆਧੁਨਿਕ ਕਵਿਤਾ ਪ੍ਰਮੁੱਖ ਕਾਵਿ-ਧਾਰਾਵਾਂ ਜਿਵੇਂ ਰਹੱਸਵਾਦ, ਰੁਮਾਂਸਵਾਦ, ਪ੍ਰਗਤੀਵਾਦ, ਜੁਝਾਰਵਾਦ, ਪ੍ਰਯੋਗਵਾਦ, ਯਥਾਰਥਵਾਦ, ਆਧੁਨਿਕਤਾਵਾਦ ਅਤੇ ਉਤਰ-ਆਧੁਨਿਕਤਾਵਾਦ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨਾ। ਭਾਈ ਵੀਰ ਸਿੰਘ ਤੋਂ ਲੈ ਕੇ ਸਮਕਾਲੀ ਪੰਜਾਬੀ ਕਵਿਤਾ ਦੇ ਪ੍ਰਮੁੱਖ ਕਵੀਆਂ ਦੀ ਕਵਿਤਾ ਅਤੇ ਉਹਨਾਂ ਦੀ ਵਿਚਾਰਧਾਰਾ ਬਾਰੇ ਸਮਝ ਹਾਸਿਲ ਕਰਨੀ।

<p><b>ਪੰਜਾਬੀ ਗਲਪ (PBI-617)</b></p>	<p>ਆਧੁਨਿਕ ਪੰਜਾਬੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਦੇ ਨਾਲ-ਨਾਲ ਪ੍ਰਮੁੱਖ ਪੰਜਾਬੀ ਕਹਾਣੀਕਾਰਾਂ ਅਤੇ ਉਹਨਾਂ ਦੀ ਕਹਾਣੀ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨਾ। ਪੰਜਾਬੀ ਨਾਵਲ ਦੇ ਸਿਧਾਂਤ , ਇਤਿਹਾਸ ਅਤੇ ਪ੍ਰਵਿਰਤੀਆਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨ ਉਪਰੰਤ ਪ੍ਰਮੁੱਖ ਪੰਜਾਬੀ ਨਾਵਲਕਾਰਾਂ ਸਬੰਧੀ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>
<p><b>ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਗੁਰਮੁਖੀ ਲਿੱਪੀ (PBI-618)</b></p>	<p>ਪੰਜਾਬੀ ਭਾਸ਼ਾ ਅਤੇ ਭਾਸ਼ਾ ਵਿਗਿਆਨ ਦੇ ਸੰਕਲਪਾਂ ਅਤੇ ਵਿਧੀਆਂ ਨੂੰ ਸਮਝਦਿਆਂ ਹੋਇਆ ਪੂਰਬੀ ਅਤੇ ਪੱਛਮੀ ਸੰਕਲਪਾਂ ਸਬੰਧੀ ਸਮਝ ਪੈਦਾ ਕਰਨੀ। ਗੁਰਮੁਖੀ ਲਿੱਪੀ ਦੇ ਜਨਮ, ਵਿਕਾਸ ਅਤੇ ਸਮਕਾਲੀ ਹਾਲਤਾਂ ਬਾਰੇ ਜਾਣਕਾਰੀ ਹਾਸਿਲ ਕਰਨੀ।</p>

## **AKAL COLLEGE OF EDUCATION, ETERNAL UNIVERSITY**

### **Programme Outcomes, Programme Specific Outcomes, Course Outcomes of B.Ed Programme**

<b>B.Ed. Programme Outcomes:</b>	To enable B.Ed. Trainees to become ideal and empowered nation builders who engage themselves in teaching-learning process as a mission and sacrifice their lives to save the learner from the clutches of evil and lead towards the light of wisdom through her harmonious development.
<b>Programme Specific Out</b>	<ul style="list-style-type: none"><li>• To encourage the pupil teachers to be a global citizen ,serving the human beings at large through the nobler profession of teaching</li><li>• To persuade the pupil teachers to act as agents of modernization, social change, promote social cohesion, international understanding, and work for protection of human rights and rights of the child.</li><li>• To enable the pupil teachers to understand the central concepts, tools of inquiry and structures of the disciplines of Education in general, and teacher education in particular.</li><li>• To make the student teachers understand how children learn and develop, how they differ in their approaches to learning, and create learning opportunities that benefit diverse learners and learning contexts.</li><li>• To imbibe knowledge, develop an understanding of the various methods and approaches of organizing learning experiences for secondary school students.</li><li>• To develop the skills of student teachers to plan learning experiences in and outside the classroom that are based on learners' existing proficiency, interests, experiences and knowledge, and enable them to understand how students come to view, develop, learn and make sense of subject matter contained in the curriculum.</li><li>• To enable them to foster creative thinking among pupils for the reconstruction of knowledge.</li><li>• To provide student teachers self-identity as a 'teacher' through school based learning experiences and reflective practices that continually evaluate the effects of their choices and actions.</li><li>• To develop communication skills for education through Information and Communication Technology.</li><li>• To acquire knowledge and develop an understanding of the various procedures and techniques of evaluation and their classroom applications.</li><li>• To enable them to undertake Action Research and use innovative practices.</li></ul>



	<ul style="list-style-type: none"> <li>To foster in student teachers a desire for life-long learning.</li> </ul>
<b>Course : B.Ed.</b>	<b>OUTCOMES</b>
<b>EDU-401</b>	To gain an understanding of the aims of education and the inter-relation of education and philosophy and to reflect upon the thoughts of Indian and Western thinkers on education and use it in teaching learning process
<b>EDU-402</b>	To orient students to the field of Child Development, its nature and scope so that they can use its knowledge in school teaching.
<b>EDU-403</b>	To enable B.Ed. Trainees to adopt a positive mindset towards purposeful reading through the use of different reading strategies and to develop right skills for application of vocabulary, grammar, pronunciation and writing.
<b>EDU-404</b>	To enable the trainees to understand the basics of research and develop research mindedness so that trainees can use it in the field of education while dealing with school at large.
<b>EDU-405</b>	To enable the students to appreciate the concept of integration of Information and Communication Technology with Education and use it in teaching learning process while teaching in schools.
<b>EDU-406</b>	To enable the students to understand the pedagogy of the Language and use it in teaching of English language
<b>EDU-407</b>	To enable the students to understand the pedagogy of the Language and use it in teaching of Hindi language
<b>EDU-408</b>	To enable the students to understand the pedagogy of the Language and use it in teaching of Punjabi language
<b>EDU-409</b>	To enable the students to understand the pedagogy of Physical Science and use it in teaching of Physical Science
<b>EDU-410</b>	To enable the students to understand the pedagogy of Life Science and use it in teaching of Life Science
<b>EDU-411</b>	To enable the students to understand the pedagogy of Mathematics and use it in teaching of Mathematics.
<b>EDU-412</b>	To enable the students to understand the pedagogy of Social Science and use it in teaching of Social Science.
<b>EDU-413</b>	To develop sense of organization and an aesthetic sense in B.Ed. Trainees through drama and art in education.
<b>EDU-414</b>	To enable B.Ed. Trainees to understand school plant and behavior of school students through school experience programme in schools.
<b>EDU-415</b>	To enable B.Ed. Trainees to understand the importance of policies & programs during pre & post-independence era and develop vision for future of Indian education.

<b>EDU-416</b>	To create awareness in B.Ed. trainees with respect to the range of cognitive capacities and affective processes in human learners and use them in teaching learning process
<b>EDU-417</b>	To understand the nature of assessment and its role in teaching learning process
<b>EDU-418</b>	To understand the sampling and difference between qualitative and quantitative research to develop research mindedness.
<b>EDU-419</b>	To enable and understand knowledge and types of curriculum and use its knowledge in teaching learning process.
<b>EDU-420</b>	To enhance teaching skills of the students in pedagogy of English language
<b>EDU-421</b>	To enhance teaching skills of the students in pedagogy of Hindi language
<b>EDU-422</b>	To enhance teaching skills of the students in pedagogy of Punjabi language
<b>EDU-423</b>	To enhance teaching skills of the students in pedagogy of Physical Science
<b>EDU-424</b>	To enhance teaching skills of the students in pedagogy of Life Science
<b>EDU-425</b>	To enhance teaching skills of the students in pedagogy of Mathematics
<b>EDU-426</b>	To enhance teaching skills of the students in pedagogy of Social Science
<b>EDU-427</b>	To enable B.Ed. Trainees to reflect through journal on the problems faced by teachers in assessment through the scheme of Continuous and Comprehensive Evaluation in schools
<b>EDU-428 to EDU-434</b>	To enable B.Ed. trainees to get hands on experience in schools for developing teaching skills among themselves
<b>EDU- 435</b>	To develop basic understanding and familiarity with key concepts– gender, gender stereotype, empowerment, gender parity, equity and equality, patriarchy and feminism and use its knowledge in teaching learning process
<b>EDU- 436</b>	To understand inclusive education and use its knowledge in dealing with diverse types of students in schools

<b>EDU- 437</b>	To enable the pupil teachers with the understanding of types of counseling and qualities of an effective counseling and qualities of an effective counselor.
<b>EDU- 438</b>	To enable the pupil teachers to do research in schools/community by the knowledge and understanding of it
<b>EDU- 439</b>	To enable student teachers to discover and develop open-mindedness, the attitude of a self-motivated learner, having self-knowledge and self-restraint.
<b>EDU- 440</b>	To enable student teachers to plan and organize community activities and club activities to address to the societal concerns and curriculum and pedagogic concerns.
<b>EDU- 441</b>	To create awareness and generate interest of student teachers in Environmental Education.
<b>EDU- 442</b>	To develop attitude of students towards developing life skills through education
<b>EDU- 443</b>	To develop an understanding of the system of education, its relationship with school curriculum management in the context of the structures and processes of the education system and its impact on pedagogic processes in the classroom.
<b>EDU- 444</b>	To enable the student teachers to develop an understanding about Health & Physical Education.

**Programme: M.A. Education (Two-Year degree programme)**

**PROGRAM OUTCOMES (POs)**

**PO1:** Professional Capacity Building: Apply the knowledge of Philosophy, Sociology, Psychology Educational Measurement & Evaluation, Educational Administration & Management in the field of teaching profession, research and extension work in the field of education in general.

**PO2:** Academic Integrity and Professional Ethics: Demonstrate academic integrity and professional ethics by keeping self-abiding to rules, regulations, values and high standards in teaching, research, and administration at diversified educational setting and Teacher Education Institutes.

**PO3:** Resilience and cope up with Complex issues: Demonstrate spirit of work in diversified situations and apply knowledge & skills to cope up educational issues in complex situations with appropriate consideration for the rules, norms and the Social, cultural, and environmental context.

**PO4:** Academic Administration and Management Capacities: Apply the knowledge of Educational administration & management and other allied subjects like Philosophy, Sociology, Psychology etc. in academic planning, organization, evaluation, decision making, resource management according to predetermined goals, norms and standards.

**PO5:** Continuous Academic Development: Identify own educational needs and requirements, keep academic development and learning in an independent way in the context of change in different aspects of education and teacher education.

**PO6:** Commitment towards Society and National Goals: Recognize areas of commitment, accountability, constitutional values, and national goals and perform accordingly.

**PO7:** Sensitivity for Emerging Issues: Apply the knowledge & skills to deal with Issues related to population, environment, gender equality, emotional problems, literacy levels etc. and respond to emerging issues by applying critical, constructive and creative thought process.

**PO8:** Research and Knowledge Creation: Involve in knowledge dissemination, knowledge creation, research and innovative educational practices related to different stakeholders of education.

**PO9:** Independent and Team Work Capacities: Perform Function effectively either in the role of member or leader in diversified educational settings and Institutions of Teacher Education.

**PROGRAM SPECIFIC OUTCOMES (PSOs)**

**PSO 1:** To build perspective and understanding of concepts, theories, ideas and practices across various fields of Education.

**PSO 2:** To understand the historical, political and economic aspect of education.

**PSO 3:** To provide research related experiences with the competency to independently develop dissertation and research work.

**PSO 4:** To interpret the schools of philosophy and their educational significance.

**PSO 5:** To get an insight into Curriculum development, various educational policies and practices.

**PSO 6:** To enable proper understanding and critical perspective about specialized areas of Education.

**PSO 7:** To enable the students to acquire Data Analysis Skills.

Course	Course Outcomes (COs)
<b>M.A. Education 1<sup>st</sup> Semester</b>	
<b>PHILOSOPHICAL AND SOCIOLOGICAL FOUNDATIONS OF EDUCATION-I (EDU-430)</b>	<b>CO 1:</b> Understand and explain the nature and functions of educational philosophy. <b>CO 1:</b> Comprehend the impact of Indian Schools of Philosophy on the educational processes. <b>CO 1:</b> Elaborate the relationship of education and social change. <b>CO 1:</b> Understand and explain the intimate relationship between education and sociology.
<b>EDUCATIONAL PSYCHOLOGY-I (EDU-431)</b>	<b>CO 1:</b> Acquire knowledge of basic concept of educational psychology. <b>CO 2:</b> Understand individual differences among learners. <b>CO 3:</b> Gain knowledge of methods of Educational Psychology and recent trends. <b>CO 4:</b> Understand adolescent's growth, development and their problems. <b>CO 5:</b> Analyze the learning process based on theoretical approaches of learning.
<b>EDUCATIONAL RESEARCH &amp; STATISTICS (EDU-432)</b>	<b>CO 1:</b> Define research problem. <b>CO 2:</b> Formulate a hypothesis. <b>CO 3:</b> Select a sample and forward reasons in support of his/her decisions. <b>CO 4:</b> Understand the meaning and importance of statistics. <b>CO 5:</b> Understand the meaning and compute measures of central tendency, measures of variability, and measures of relationship. <b>CO 6:</b> Understand the meaning and application of normal probability curve. <b>CO 7:</b> Select and conduct the statistical analysis of data by applying the statistics suitable for the problem
<b>GUIDANCE &amp; COUNSELING-I (EDU-433)</b>	<b>CO 1:</b> Explain the concept, aims, principles and types of guidance. <b>CO 2:</b> Describe the nature of guidance programme. <b>CO 3:</b> Understand the purpose of services of guidance. <b>CO 4:</b> Understand the roles of various guidance personnel
<b>SPECIAL EDUCATION-I (OPTIONAL) (EDU-434)</b>	<b>CO 1:</b> Explain nature and causes of exceptionality. <b>CO 2:</b> Suggest the alternative or remedial educational provisions for special children. <b>CO 3:</b> Understand concept of mental retardation and provisions for them. <b>CO 4:</b> Understand the process of practical assessment of special children.
<b>EDUCATIONAL MEASUREMENT AND EVALUATION-I (OPTIONAL)</b>	<b>CO 1:</b> Explain the concepts and techniques of measurement and evaluation. <b>CO 2:</b> Develop skills in the construction and standardization of tests.

<b>(EDU-435)</b>	<b>CO 3:</b> Explain the applications of advanced statistical techniques.
<b>EDUCATIONAL ADMINISTRATION AND MANAGEMENT-I (OPTIONAL) (EDU-436)</b>	<b>CO 1:</b> Explain concepts of administration and management. <b>CO 2:</b> Apply these concepts in management of education systems. <b>CO 3:</b> Describe the different administrative structures for different levels of education. <b>CO 4:</b> Explain the role of national, state and local level bodies responsible for educational administrations.
<b>M.A. Education 2<sup>nd</sup> Semester</b>	
<b>PHILOSOPHICAL AND SOCIOLOGICAL FOUNDATIONS OF EDUCATION-II (EDU-437)</b>	<b>CO 1:</b> To reflect upon the thoughts of Indian and Western thinkers on education and explore the implications of the concepts involved in educational practices. <b>CO 2:</b> To promote reflective thinking through philosophy. <b>CO 3:</b> To correlate sociology and education. <b>CO4:</b> To establish the relevancy of philosophical theories in modern education system. <b>CO 5:</b> To interpret the role of education in social context. <b>CO 6:</b> Connect theory to real world information and practice Develop an ability to employ aspects of philosophical analysis and reasoning, as well as critical thinking skills, in the context of writing about the philosophy of education; <b>CO7:</b> To inculcate sensitivity and values in education. <b>CO8:</b> To develop vision for future of Indian Education system.
<b>EDUCATIONAL PSYCHOLOGY -II (EDU-438)</b>	<b>CO 1:</b> Gain knowledge about the concept and theories of personality and its Assessment <b>CO 2:</b> Understand and measure the learner's cognitive abilities with special reference to intelligence <b>CO3:</b> Differentiate between characteristics of adjusted and maladjusted learners <b>CO 4:</b> Understand learner in Psycho-social context. <b>CO 4:</b> Get acquainted with concept and nature of children with special needs
<b>EDUCATIONAL RESEARCH &amp; STATISTICS-II (EDU-439)</b>	<b>CO 1:</b> Select the tools for studying different variables. <b>CO 2:</b> Understand historical, descriptive and experimental method of research. <b>CO 3:</b> Select/ formulate the design of the study by controlling and classifying the variables demanded by the design. <b>CO 4:</b> understand the meaning and compute ANOVA, Chi square <b>CO 5:</b> Report the research work in accordance with the current trends and procedures of report writing. <b>CO6:</b> Select and conduct the statistical analysis of the data by applying the statistics suitable for the problem.
<b>GUIDANCE AND COUNSELLING-II (OPTIONAL) (EDU-440)</b>	<b>CO 1:</b> Understand relevance of helping relationship. <b>CO 2:</b> Become acquainted with the concept and relevance of counselling in Indian situations. <b>CO 3:</b> Understand the skills of counselling. <b>CO 4:</b> Elaborate upon theories of counselling.

	<b>CO 5:</b> Understand evaluation in counselling.
<b>SPECIAL EDUCATION-II (OPTIONAL) (EDU-441)</b>	<b>CO 1:</b> Describe nature and causes of exceptionality. <b>CO 2:</b> Discuss problems of exceptional children in regular school. <b>CO 3:</b> Suggest alternative or remedial educational provisions for special children. <b>CO 4:</b> List the identifying characteristics of exceptional children.
<b>EDUCATIONAL MANAGEMENT AND EVALUATION-II (OPTIONAL) EDU-442)</b>	<b>CO 1:</b> Explain the concepts and techniques of measurement and evaluation. <b>CO 2:</b> Develop skills in the construction and standardization of tests. <b>CO 3:</b> Explain the applications of advanced statistical techniques.
<b>EDUCATIONAL ADMINISTRATION AND MANAGEMENT-II (OPTIONAL) (EDU-443)</b>	<b>CO 1:</b> Highlight need, importance and scope of educational planning. <b>CO 2:</b> Describe various approaches to planning. <b>CO 3:</b> Explain different stages of educational planning. Discuss the problems in implementing plans. <b>CO 4:</b> Explain meaning and functions of supervision in education. <b>CO 5:</b> Describe concepts and implications of organizational climate, job satisfaction, motivation and conflict management for teachers and administrators.
<b>M.A. Education 3<sup>rd</sup> Semester</b>	
<b>HISTORY AND CONTEMPORARY ISSUES OF INDIAN EDUCATION-III (EDU-444)</b>	<b>CO1:</b> Understand the Pre-independence and post-independence development of education in India. <b>CO2:</b> Understand the factors from historical perspective that contributed to present education system. <b>CO3:</b> Explain the important features of various reports, commissions and policies of education during pre and post - independence development of Education - In India.
<b>CURRICULUM DEVELOPMENT-III (EDU-445)</b>	<b>CO 1:</b> Explain the concept and components of curriculum. <b>CO 2:</b> Explain the foundations of curriculum. <b>CO 3:</b> Explain the Principles of curriculum construction. <b>CO 4:</b> Describe factors affecting curriculum change. <b>CO 5:</b> Explain the role of teacher as curriculum maker. <b>CO 6:</b> Explain eclectic model of curriculum design. <b>CO 7:</b> Explain Taba's model of curriculum development.
<b>GUIDANCE AND COUNSELLING-III (OPTIONAL) (EDU-446)</b>	<b>CO 1:</b> Understand relation between guidance and counselling <b>CO 2:</b> Understand importance of assessment in counselling <b>CO 3:</b> Learn testing and non-testing techniques of assessment <b>CO 4:</b> Understand concept and process of adjustment and mental health



<b>SPECIAL EDUCATION-III (OPTIONAL) (EDU-447)</b>	<b>CO 1:</b> Explain nature and causes of exceptionality. <b>CO 2:</b> Explain problems of exceptional children in regular school. <b>CO 3:</b> Explain the therapeutic or remedial or alternative educational provisions for special children. <b>CO 4:</b> Conduct a case study. <b>CO 5:</b> Explain social issues related with disability.
<b>EDUCATIONAL MANAGEMENT AND EVALUATION-III (OPTIONAL) (EDU-448)</b>	<b>CO 1:</b> Explain the concept and theories of leadership. <b>CO 2:</b> Explain different styles of leadership. <b>CO3:</b> Describe the leadership traits and skills of educational administrators. <b>CO 4:</b> Explain therefore teaching and Training for leadership. <b>CO 5:</b> Explain the financial policy for education. <b>CO 6:</b> Explain importance of budget preparation for education. <b>CO 7:</b> Explain the concept and theories of organizational change. <b>CO8:</b> Explain the importance of organizational change and modernization of educational management.
<b>EDUCATIONAL ADMINISTRATION AND MANAGEMENT-III (OPTIONAL) (EDU-449)</b>	<b>CO 1:</b> Understand the concept and techniques of measurement and evaluation. <b>CO 2:</b> Attain knowledge of the applications of advanced statistical techniques.
<b>M.A. Education 4<sup>th</sup> Semester</b>	
<b>HISTORY AND CONTEMPORARY ISSUES OF INDIAN EDUCATION-IV (EDU-450)</b>	<b>CO 1:</b> Explain the contemporary issues of Indian Education System. <b>CO 2:</b> Enlist modern trends of Education in India. <b>CO 3:</b> Explain education system from International perspective.
<b>CURRICULUM DEVELOPMENT-IV (EDU-451)</b>	<b>CO 1:</b> Understand the concept and need of curriculum design. <b>CO2:</b> Describe characteristic features of different designs of curriculum development. <b>CO3:</b> Understand the various models of curriculum engineering. <b>CO4:</b> Appraise present curriculum of Indian schools. • Discuss curriculum issues and trends.
<b>GUIDANCE AND COUNSELLING-IV (OPTIONAL) (EDU-452)</b>	<b>CO 1:</b> Understand concept and problems of Persons with disability (PWDs) <b>CO 2:</b> Know importance of counselling of PWDs and their care takers <b>CO 3:</b> Familiarized themselves with national incentive for PWDs <b>CO 4:</b> Get sensitized to child abuse <b>CO5:</b> Understand concepts of career counselling and career development
<b>SPECIAL EDUCATION-IV (OPTIONAL) (EDU-453)</b>	<b>CO 1:</b> Explain the nature and causes of exceptionality. <b>CO 2:</b> Enlist problems of exceptional children in regular school. <b>CO 3:</b> Explain community situation in their own area. <b>CO 4:</b> Explain legislation and policies in India.

	<b>CO 5:</b> Explain concept of rehabilitation in Indian Setting.
<b>EDUCATIONAL MANAGEMENT AND EVALUATION-IV (OPTIONAL) (EDU-454)</b>	<b>CO 1:</b> The students will be able to: <b>CO2:</b> Explain the concepts and techniques of measurement and evaluation. <b>CO3:</b> Apply advanced statistical techniques.
<b>EDUCATIONAL ADMINISTRATION AND MANAGEMENT-IV (OPTIONAL) (EDU-455)</b>	<b>CO1:</b> Explain implications of Liberalization, Globalization and Privatization on educational management. <b>CO2:</b> Discuss implications of Intellectual Property Rights and RTI for educational institutions and educationists. <b>CO3:</b> State policy guidelines for setting up private Education – Institutions. <b>CO4:</b> Explain administrative processes in educational settings. <b>CO 5:</b> Describe the impact of information technology on educational administration and management. <b>CO6:</b> Enlist strategies for effective online management of education systems.
<b>Field Work (Dissertation) EDU-456</b>	<b>CO 1:</b> To effectively execute research projects. <b>CO 2:</b> To develop the link between educational theory and research. <b>CO3:</b> To articulate and formulate the research problems. <b>CO4:</b> To scientifically design the research plans. <b>CO5:</b> To analyse and interpret data quantitatively and qualitatively.

**AKAL COLLEGE OF EDUCATION  
ETERNAL UNIVERSITY, BARU SAHIB  
PROGRAMME -Ph.D. (Education)**

**1. Programme Outcomes (POs) for Ph.D. (Education)**

These outcomes describe the broad, long-term goals that students should achieve by the end of the Ph.D. program in Education:

1. **Research Expertise:** Demonstrate advanced research skills in education, including the ability to design, conduct, and evaluate original research projects in various educational contexts.
2. **Theoretical Knowledge:** Acquire a comprehensive understanding of contemporary educational theories and philosophies, as well as historical and cultural contexts of education.
3. **Critical Thinking and Problem Solving:** Develop the capacity for critical analysis of educational issues, policies, practices, and outcomes. Contribute to innovative solutions to real-world problems in education.
4. **Academic Writing and Communication:** Cultivate the skills necessary for effective academic writing, publishing research findings, and communicating complex ideas in both written and oral formats.
5. **Leadership and Teaching Excellence:** Be prepared to take on leadership roles in educational institutions or organizations, demonstrating the ability to lead, inspire, and educate future generations of scholars and practitioners.
6. **Ethical and Social Responsibility:** Exhibit strong ethical principles and a commitment to social justice in educational research and practice, with sensitivity to diverse cultural, social, and political environments.
7. **Interdisciplinary Collaboration:** Collaborate across disciplines to address multifaceted educational challenges and engage in collaborative problem-solving at local, national, and international levels.

**2. Programme Specific Outcomes (PSOs) for Ph.D. (Education)**

These are outcomes that specifically pertain to the specialized focus of the Ph.D. programme in Education:

1. **In-depth Knowledge in Specializations:** Attain specialized knowledge in key areas of education such as curriculum design, educational policy, educational psychology, assessment and evaluation, or inclusive education.
2. **Contributions to Educational Theory and Practice:** Contribute new perspectives, methods, and solutions to existing educational theories and practices through innovative and rigorous research.
3. **Policy and Practice Advocacy:** Develop the ability to critically analyze and influence educational policies and practices at local, national, and international levels, contributing to the improvement of education systems.
4. **Advanced Research Methodology:** Gain proficiency in both qualitative and quantitative research methodologies, and apply them to educational contexts to contribute new knowledge.

5. **Professional Development:** Become capable of assuming roles such as researchers, academicians, policymakers, and leaders within educational institutions or research organizations.

### 3. Course Outcomes (COs) for Ph.D. (Education)

Course outcomes are focused on specific knowledge and skills to be acquired during individual courses in the Ph.D. programme. They are more granular and specific than the programme outcomes.

1. **Research Methodology in Education:**
  - Students will be able to design, conduct, and interpret educational research, both qualitative and quantitative, with a solid understanding of ethical research practices.
  - Gain proficiency in statistical analysis tools and software used in educational research.
2. **Educational Psychology:**
  - Students will develop an understanding of cognitive and developmental psychology as it relates to education, with the ability to apply psychological principles to improve learning outcomes.
3. **Curriculum Design and Development:**
  - Students will develop skills to analyze, design, and evaluate curricula for different educational levels, incorporating contemporary pedagogical theories and technological advancements.
4. **Assessment and Evaluation in Education:**
  - Gain expertise in various forms of assessment (formative, summative, diagnostic), understanding how they influence teaching and learning, and evaluating educational effectiveness.
5. **Educational Leadership and Policy:**
  - Develop a thorough understanding of leadership theories, organizational structures, and the role of policy in shaping education systems, preparing students for leadership roles in education.

### 4. Course Specific Outcomes (CSOs)

Based on the provided courses for a Ph.D. program in Education, here are the course-specific outcomes that could be framed:

#### Section – I (Core Courses)

##### 1. MATH-599: Research Methodology (Compulsory)

- **CO1:** Develop a deep understanding of various research methodologies, including qualitative, quantitative, and mixed methods approaches.
- **CO2:** Demonstrate the ability to design a research proposal that includes problem formulation, literature review, methodology selection, and hypothesis generation.
- **CO3:** Gain expertise in advanced statistical techniques for data analysis, including sampling methods and data interpretation.

- **CO4:** Critically evaluate existing research and apply appropriate methods to solve research problems in the field of education.
- **CO5:** Exhibit proficiency in writing research reports and scholarly papers based on rigorous data analysis.

## **2. EDU-691: Seminar (Compulsory)**

- **CO1:** Engage in academic discussions by presenting current research trends and literature in education.
- **CO2:** Develop the skills to critically analyze and assess the work of peers and senior researchers in the field of education.
- **CO3:** Learn to synthesize research findings, identify gaps, and propose new directions for research.
- **CO4:** Enhance academic communication skills by presenting research findings clearly and confidently in a seminar setting.
- **CO5:** Foster a collaborative research environment through active participation and feedback exchange with fellow researchers.

## **3. EDU-700: Doctoral Research (Preparation of Synopsis) (Compulsory)**

- **CO1:** Formulate a comprehensive research synopsis that outlines the objectives, methodology, and expected outcomes of the doctoral research project.
- **CO2:** Develop proficiency in literature review techniques and establish a solid theoretical foundation for the proposed research.
- **CO3:** Gain expertise in preparing a detailed research plan, including timeline, resources, and potential challenges.
- **CO4:** Demonstrate critical thinking and scholarly writing skills in crafting a proposal that addresses key educational issues.
- **CO5:** Prepare for the successful approval of the research proposal by presenting it clearly and convincingly to academic advisors and committees.

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## **Section – II (Optional Courses)**

### **4. EDU-457: Statistics in Education (Optional)**

- **CO1:** Understand and apply various statistical methods used in educational research, including descriptive and inferential statistics.
- **CO2:** Analyze educational data and interpret results to draw meaningful conclusions that inform educational practices.
- **CO3:** Develop expertise in using statistical software to perform complex data analysis for educational research.
- **CO4:** Critically evaluate the strengths and limitations of different statistical techniques in the context of educational research.
- **CO5:** Apply statistical findings to improve educational programs, policies, and practices.

## **5. EDU-458: Inclusive Education (Optional)**

- **CO1:** Understand the principles and practices of inclusive education and its application in diverse educational settings.
- **CO2:** Analyze the challenges and opportunities related to inclusive education in different socio-cultural contexts.
- **CO3:** Design effective educational interventions for students with diverse needs, including disabilities, language barriers, and cultural differences.
- **CO4:** Promote inclusive practices through collaboration with teachers, parents, and the community to create an inclusive learning environment.
- **CO5:** Assess the impact of inclusive education on student learning outcomes and overall school development.

## **6. EDU-459: Teacher Education & Contemporary Issues in Education (Optional)**

- **CO1:** Explore contemporary issues and challenges in teacher education and their implications for policy and practice.
- **CO2:** Critically assess current models of teacher training and identify areas for reform and improvement.
- **CO3:** Examine the role of technology, pedagogy, and curriculum in shaping teacher education programs.
- **CO4:** Investigate global trends in teacher education and adapt international best practices to local contexts.
- **CO5:** Propose innovative approaches to professional development and lifelong learning for educators.

## **7. EDU-460: Ethics in Research & Publication (Optional)**

- **CO1:** Understand the ethical principles that govern research in education, including informed consent, confidentiality, and integrity.
- **CO2:** Develop the ability to identify and address ethical dilemmas encountered during research and publication processes.
- **CO3:** Learn the ethical considerations specific to educational research, including the use of vulnerable populations and culturally sensitive approaches.
- **CO4:** Promote transparency and accountability in research, ensuring the credibility and reliability of findings.
- **CO5:** Navigate the complexities of academic publishing, including the peer review process and avoiding issues like plagiarism.

## **8. EDU-461: Guidance & Counselling (Optional)**

- **CO1:** Gain a deep understanding of the principles, theories, and practices of guidance and counseling in educational settings.
- **CO2:** Develop skills in providing academic, career, and personal counseling to students, addressing their emotional and developmental needs.
- **CO3:** Learn to design and implement effective guidance programs that promote student well-being and success.
- **CO4:** Apply counseling techniques to resolve student challenges, including academic pressure, mental health concerns, and career-related issues.

- **CO5:** Collaborate with educators, parents, and administrators to support students in overcoming barriers to their success.

#### **EDU-462: ICT in Education (Optional)**

- **CO1:** Understand the role and impact of Information and Communication Technology (ICT) in modern educational settings.
- **CO2:** Develop proficiency in using various ICT tools and platforms to enhance teaching and learning processes.
- **CO3:** Evaluate the effectiveness of ICT in facilitating student engagement, collaboration, and knowledge retention.
- **CO4:** Design technology-integrated lesson plans and curricula that meet diverse learning needs.
- **CO5:** Investigate the ethical, social, and pedagogical issues related to the use of ICT in education.

#### **EDU-463: Educational Measurement & Evaluation (Optional)**

- **CO1:** Understand the fundamental concepts and principles of educational measurement and evaluation.
- **CO2:** Develop and apply various assessment tools and techniques to evaluate student learning and educational programs.
- **CO3:** Analyze test results and use data to make informed decisions about curriculum and instruction.
- **CO4:** Explore the role of formative and summative assessment in enhancing the educational experience.
- **CO5:** Ensure fairness and accuracy in assessment practices, considering cultural, linguistic, and individual differences.

#### **EDU-464: Leadership in Education (Optional)**

- **CO1:** Understand the theoretical frameworks and practical applications of leadership in educational settings.
- **CO2:** Develop the ability to inspire and lead educational institutions toward achieving academic and organizational goals.
- **CO3:** Cultivate key leadership skills, including decision-making, conflict resolution, and communication.
- **CO4:** Analyze the role of educational leaders in shaping policy, promoting innovation, and fostering a positive school culture.
- **CO5:** Lead initiatives for change and improvement in schools, leveraging data-driven strategies to achieve better student outcomes.