Programme Ph.D. (CSE)

Programme Outcomes:

PO1. Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2. 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 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. 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

PO5. 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. 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. 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

PO8. 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.

Programme Specific Outcomes:

PSO1. Model computational problems by applying mathematical concepts and design solutions using suitable data structures and algorithmic techniques.

PSO2. Design and develop solutions by following standard software engineering principles and implement by using suitable programming languages and platforms

PSO3. Develop system solutions involving both hardware and software modules

PSO4. Acquaint with the contemporary trends in industrial/research settings and thereby innovate novel solutions to existing problems

PSO5. Design and develop computer programs/computer-based systems in the areas related to algorithms, networking, web design, cloud computing, IoT and data analytics of varying complexity

PSO6. Demonstrate basic knowledge of computer applications and apply standard practices in software project development.

PSO7. Understand, Analyze and Develop computer programs for efficient design of computer-based systems of varying complexity.

Course	Course Outcomes
CSE610 Advanced Cloud Storage Infrastructure	CO1.Explain the concepts of Cloud Computing CO2. Explain the technology incorporated in Cloud Computing CO3. Explain the architecture of Cloud Computing CO4. Explain the business processes involved in Cloud Computing CO5. Explain the benefits of Cloud Computing through case studies
CSE611 Advanced Cloud Security	CO1. Appraise cloud computing architectures. CO2. Identify the threats, risks, vulnerabilities, side-channel attacks, and privacy issues associated with cloud-based IT services. CO3. Implement safeguards and countermeasures for cloud-based IT services. CO4. Configure cloud services. CO5. Apply security architectures that assure secure isolation of physical and logical infrastructures.
CSE612 Advanced Cloud Architecture	CO1.Understand cloud computing architectural principles, constraints, and best practices; CO2. Design cloud-based solutions using appropriate architectural design principles and best practices to address customer requirements and deliver quality cloud-based solutions; CO3. Design architectures to achieve high availability, scalability (including

	auto scaling), infrastructure automation (infrastructure as software), decoupling, and web-scale storage; CO4. Design architectures based on the main pillars of Cloud Computing: security, reliability, performance efficiency and cost optimization
CSE613 Advanced Mobile and Cloud computing	CO1.To understand the principles and paradigm of Cloud Computing CO2. Ability to design and deploy Cloud Infrastructure CO3.Understand cloud security issues and solutions CO4.To gain knowledge of installing Android Studio and Cross Platform Integrated Development Environment. CO5.An ability to use the techniques, skills, and modern technology.
CSE615 Advanced Cloud Strategy Planning and Management	CO1. Strategically assess how cloud computing enables IT Transformation and business value in an organization. CO2. Analyze the role that cloud computing can play in the business process. CO3. Critically appraise how the incorporation of cloud computing in an IT strategy can deliver on strategic business objectives. CO4. Evaluate how cloud computing and Service Oriented Architecture (SOA) can deliver business agility
CSE617 Design and development of cloud application	CO1.Design and develop elegant and flexible cloud software solutions. CO 2 Evaluate the security issues related to the development of cloud applications. CO 3 Manage and deploy a cloud-based application. CO 4 Research and critique a topic related to Software development in the cloud. CO 5 Analyze a real-world problem and develop a cloud-based software solution
	Option II
CSE221 Applied Cryptography	CO1. Understand the security properties of the cryptographical technologies CO2. Describe the cryptographical technologies CO3. Identify the vulnerabilities of the cryptographical technologies

	CO4. Apply the cryptanalysis skills to evaluate the cryptographical technologies
CSE622 Advanced Intrusion Detection and Prevention System	CO1.Understand modern concepts related to Intrusion Detection System. CO2. Compare alternative tools and approaches for Intrusion Detection through quantitative analysis to determine the best tool or approach to reduce risk from intrusion CO3. Identify and describe the parts of all intrusion detection systems and characterize new and emerging IDS technologies according to the basic capabilities all intrusion detection systems share
CSE623 Advanced Cyber Laws & Security Policies	CO1. Make Learner Conversant with The Social and Intellectual Property Issues Emerging From 'Cyberspace. CO2. Explore the Legal and Policy Developments in Various Countries to Regulate Cyberspace CO 3. Develop the Understanding of Relationship Between Commerce and Cyberspace
CSE624 Advanced Software Vulnerability Analysis	CO1.To learn the tools that can be used to perform information gathering. CO2. To identify operating systems, server applications to widen the attack surface and perform vulnerability assessment activity and exploitation phase. CO3.To learn how vulnerability assessment can be carried out by means of automatic tools or manual investigation. CO4.To learn the web application attacks starting from information gathering to exploitation phases.
CSE625 Advanced Web Security	CO1. describe how sensitive data is vulnerable to hackers CO2. describe the vulnerabilities associated with XXE CO3. describe the importance of an authorization hierarchy for users CO4. explain the importance of appropriate security configuration

CSE603 Advanced Network Security	CO1. Describe network security services and mechanisms. CO2. Symmetrical and Asymmetrical cryptography. CO3. Data integrity, Authentication, Digital Signatures. CO4. Various network security applications, IPSec, Firewall, IDS, Web security, Email security, and Malicious software etc.
	Option III
CSE606 Distributed Operating System	**CO1. To analyze** the current popular distributed systems such as peer-to-peer (P2P) systems will also be analyzed. CO2: To know about Shared Memory Techniques. CO3: Have Sufficient knowledge about file access. CO4: Have knowledge of Synchronization and Deadlock
CSE608 Advanced Software Engineering	CO1. Analyze the software life cycle models. CO2. Identify the importance of the software development process. CO3.Analyze the importance of CASE tools. CO4. Design and develop correct and robust software products using advanced software engineering techniques
CSE631 Advanced Pattern Oriented Software Architecture	CO1. Utilize processes and artifacts to work effectively in a team-oriented development environment CO2. Apply various software architectures, including frameworks and design patterns, when developing software projects CO3. Develop Smalltalk applications CO4. Program distributed applications in a Java environment CO5. Effectively construct medium-sized object-oriented programs
CSE632 Advanced Agile Software Process	CO1. Introduce the concept of development agility and the Agile Manifesto CO2. Review each of the major agile development methods underscoring their strengths and weaknesses CO3. Understand how to manage an agile environment even within a structured organizational approach CO4.Learn how to introduce agility into a development organization

CSE633 Advanced Software Project Management	CO1. Develop the model from the conventional software product to the modern. CO2. Analyze and design the software architecture. CO3. Have an exposure for organizing and managing a software project. CO4. Apply, analyze, design and develop the software project. CO5.Design various estimation levels of cost and effort.
CSE635 Advanced Software Engineering	CO1.Understand the architecture, creating it and moving from one to any, different structural patterns. CO2. Analyze the architecture and build the system from the components. CO3.Design creational and structural patterns. CO4. Learn about behavioral patterns
CSE636 Advanced Software Testing	CO1. List a range of different software testing techniques and strategies and be able to apply specific (automated) unit testing method to the projects. CO2) Distinguish characteristics of structural testing methods. CO3) Demonstrate the integration testing which aims to uncover interaction and compatibility problems as early as possible. CO4) Discuss about the functional and system testing methods.