

## Department of Microbiology, Akal College of Basic Sciences

### Ph.D. Microbiology (Research Programme)

<b>Program Outcomes</b>	On completion of Ph.D. 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.