Syllabus for PhD Admission Test
Biotechnology

Molecular Biology, Genomics, Proteomics, & Metabolic Engineering

Structure and regulation of prokaryotes and eukaryotes genes, post-transcriptional and translational modifications, phyllogenetics, molecular markers, genetic and physical mapping, cloning and expression vectors, rDNA technology, gene cloning approaches, whole genome sequencing & annotation, high throughput gene expression and function elucidation technologies, protein-protein interactions, MALDI-TOF MS, LC-MS, high throughput identification of biomarkers, Signal transduction pathways and their elucidation, primary and secondary metabolic pathways, systems biology frameworks for metabolic engineering, bioinformatics and statistics, Biodiversity, IPR, Biosafety & Bioethics

Microbiology, Immunology and Diagnostics

Biology of microbes, infectious diseases, immunology, molecular virology, cancer biology, cell & developmental biology, immunotechnology, antibody engineering, vaccines and the associated manufacturing processes, moleuclar diagnostics and their applications, cell culture technologies, regenerative medicine & transplantation technology, animal biotechnology.

Bioprocess Engineering, Fermentation Technology & Downstream Processing

Bioprocessing vs. chemical processing, Substrates for bioconversion processes, Inoculum development, Process technology for production of primary metabolites, such as baker's yeast, ethanol, citric acid, amino acids, polysaccharides and plastics, Microbial production of industrial enzymes, Production of secondary metabolites, Operation Batch, Fed-batch, CSTR, packed bed reactor, Immobilization, Aeration and agitation, Recovery and purification of fermentation products: removal of insoluble, concentration and purification, effluent treatment, principle and large scale instrumentation requirement for downstream processing.