

Int. PhD in Biological Science  
Laboratory- I: I Semester – Aug-Dec, 2016  
Credits 1:3

Course Content:

**1. Microbiology and Molecular Biology**

Laboratory Safety – Principles and practice of general safety, chemical safety, biological safety and radioactive safety. Principles, methods and practice of sterilization. Microbial Genetics including preparation of solid and liquid media, isolation and growth of microbes in liquid and solid media, growth characteristics and identification of bacteria and their transformation. Isolation of plasmid DNA and genomic DNA from various sources, restriction digestion, agarose gel electrophoresis and Southern blotting of DNA. Preparation, handling and use of radioactive probes. Oligonucleotide primer design strategies. Polymerase Chain Reaction – principle, methods and practice. Recombinant DNA Technology – including generation of recombinant DNA's and cloning in bacteria. Selection and validation of the recombinant clones by blue-white colony screening, plasmid DNA isolation, insert release by restriction digestion, PCR using rDNA as template, protein expression by immunoblotting and DNA Sequencing.

**2. Neuroanatomy**

- Dissecting vertebrate brain (demo – sheep brain)
- Stereotaxy of rat brain
- Dissection and staining of mouse brain
- Dissection and staining of invertebrate nervous system (earthworm, flies, grasshopper)
- Hands-on practice of preparation of slices and whole mounts of vertebrate and invertebrate nervous tissue and imaging using epifluorescence microscopy