

## **MB2PGP2 - LABORATORY COURSE-II**

**Credits: 4**

**(Microbiology, Immunology, Molecular Biology and Genetic Engineering)**

### **MICROBIOLOGY AND IMMUNOLOGY**

- Microscopic examination of bacteria in living conditions
- Testing of motility
- Staining procedures- Gram's, Volutin, Spore, Capsule, Negative, Acid Fast, Fungal staining etc.
- Cultivation of bacteria and fungi
- Sterilization methods
- Study of cultural characteristics and biochemical reaction of bacteria
- Testing of disinfectants
- Bacterial growth curve
- Antibiotic sensitivity tests- disc diffusion, MIC
- Sterility testing of solution, vaccines, drugs and surgical methods
- Raising of immune sera
- Serological tests for the diagnosis of microbial infections
- Agglutination and precipitation tests
- Immunodiffusion in gel
- ELISA

### **MOLECULAR BIOLOGY AND GENETIC ENGINEERING**

- PAGE- Protein separation
- DNA and RNA isolation from different sources
- Agarose gel electrophoresis of nucleic acids
- Estimation of DNA and RNA
- Polymerase Chain Reaction

- Restriction enzyme digestion
- Ligation, Bacterial transformation and blue white screening
- Expression and purification of recombinant proteins
- Comparison of microbial genome size
- Online sequence analysis, BLAST
- Phylogenetic analysis

## References

1. Cheesbrough M (2006) *District Laboratory Practice in Tropical Countries. Vol.2* Cambridge University Press. 2<sup>nd</sup> ed.
2. Collee JG & Mackie TJ (1996) *Mackie and McCartney Practical Medical Microbiology* .Churchill Livingstone, Edinburgh. 14<sup>th</sup> ed
3. Gradwohl RBH, Sonnenwirth AC, & Jarett L (1980) *Gradwohl's Clinical Laboratory Methods and Diagnosis* .Mosby, St Louis, Mo. ; London. 8<sup>th</sup> ed
4. Dubey RC & Maheshwari DK (2002) *Practical Microbiology* (S. Chand & Company Limited
5. Aneja KR (2003) *Experiments In Microbiology, Plant Pathology And Biotechnology*. New Age International.
6. Sambrook J. and Russell D. 2001. *Molecular Cloning: A Laboratory Manual*, 3rd edition. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.
7. Sambrook J., Fritsch E.F., and Maniatis T. 1989. *Molecular Cloning: A Laboratory Manual*, 2nd edition. Cold Spring Harbor Laboratory Press, Cold Spring Harbor, New York.