

PMBB-III RESEARCH METHODOLOGY

Unit 1. Instrumentation – Basic techniques in Microscopy, Spectroscopy, Spectrometry, Centrifugation, Electrophoresis (gel and chip), Biacore, Gene gun (biolistic), etc.

Unit 2. Core Techniques of Molecular Biology – Cloning methodologies, Expression vectors, PCR and its modifications, Gene expression studies, Bimolecular interaction studies, Next Generation Sequencing (NGS) methodologies, Protein sequencing, etc.

Unit 3. Literature Survey – Reading and interpretation of research papers, Critical analyses of research problems, Research design, Sampling, Patent search, etc.

Unit 4. Computer Applications -- Basics of Computer Operating System: basics of UNIX and Linux commands, Using Windows, Directory structures, Command structure (Document preparation, EXCEL, Power Point Presentation), Scientific editing tools, etc.

Unit 5. Database Search & their Utilities – Data mining and analysis, preparation and interpretation.

Unit 6. Introduction to Biostatistics - Univariate analysis (frequency tables, bar charts, pie charts, percentages), Bivariate analysis, Cross tabulations, t-test, Chi-square test, correlation, SPSS, p-value, ANOVA (analysis of variance), cluster analysis, etc.

Unit 7. Presentation skills – Oral and written presentations, Hand-outs and Brochures, Paper and grant writing skills, Thesis writing tutorials, Project work (drafting a research paper or a project work), etc.

Unit 8. Ethics in science - Copy right, Royalty, Intellectual property rights and Patent laws, Reproduction of published material, Plagiarism, Citation and acknowledgements, Reproducibility and accountability, Conflict of Interest, etc.