

SEMESTER – III

Course Title	RESEARCH METHODOLOGY AND BIOSTATISTICS
Total Hrs	75
Hrs/Week	5
Sub.Code	21PCMB33
Course Type	DSC -IX
Creditss	4
Marks	100

General Objective:

The course creates knowledge in writing research articles and paves a way to interpret the statistical results.

Course Objectives:

CO No.	The learners will be able to
CO-1	Identify the various research areas.
CO-2	Practise the Presentation in Seminars and Conferences.
CO-3	Experiment the Research methods in biological sciences.
CO-4	Collect the Basics in Biostatistics.
CO-5	Evaluate the Different forms Measures of central tendency.

UNIT I: Basics of Research (15 hours)

Introduction – importance - identification of research areas. Review of Literature- Research design and experimentation-Preparation of research report. Guidelines for preparing an article -ISSN, ISBN impact factor, citation index, h-index, I-index, Google scholar, Scopus. Computers in biological research-methods of data presentation, graphical representation by histogram, polygon, ogive curves and pie diagram.

UNIT II: Article Publication (15 hours)

Presentation in Seminars and Conferences - Writing scientific paper- Organization of scientific paper - Importance of title -abstract –key words, Introduction, Materials and methods, Results, Discussion. Acknowledgements and References - Publication in research journals - Standards of Research journals- Peer - Review – Impact factor - Citation index - Preparation of manuscript – Proof correction - Proof correction marks- Method of correcting

proof- Writing chapters in books -Preparation of Research proposal and funding agencies – Research fellowships.

UNIT III: Research and Project writing methods (15 hours)

Research-Definition, Objectives, Types and Importance - Research methods in biological sciences - Research process- Literature survey – Sources –Scientific databases- Research report writing – Parts of Thesis and Dissertation –Title, certificate, declaration, acknowledgements, contents, List of tables, figures, plates & abbreviations, Introduction, Review of literature, Materials and methods-Results – Presentation of data – Tables, figures, map, graphs, photographs – Discussion – Summary, Bibliography/ References and Appendix.

UNIT IV: Basics in Biostatistics (15 hours)

Basic definitions and applications Biostatistics - Statistical methods - Basic principles. Variables - measurements, Functions, Limitations and Uses of Statistics. Collection of data primary and Secondary - Types and methods of data collection procedures - merits and demerits. Classification - tabulation and presentation of data - sampling methods graphical representation by histogram, polygon, ogive curves and pie diagram.

UNIT V: Measures of central tendency (15 hours)

Mean, Median, Mode, Geometric mean - Merits and Demerits. Measures of dispersion - Range, Standard deviation, standard error, range, Mean deviation, Quartile deviation - Merits and Demerits; Co-efficient of variations. Correlation - Types and methods of Correlation, Regression, Simple Regression equation, Statistical inference - Hypothesis - Simple hypothesis - Student 't' test - Chi square test ANOVA, one and two way classification.

REFERENCE BOOKS:

1. Vijayalakshmi, G. and C. Sivapragasam. *Research Methods (Tips and Techniques)*. MJP Publishers, Chennai, 2008.
2. Gurumani, N. *Research Methodology for Biological Sciences*. MJP Publishers, Chennai, 2006.
3. Ramamurthi and Geetha Bali. *Bioethics and Biosafety*. APH Publishing, New Delhi, 2007.

Course Outcomes

CO No.	Upon completion of the course, the students will be able to	PSOs Addressed	Cognitive Level
CO-1	Report the general laboratory procedures and maintenance of research equipments.	1,2	Understanding
CO-2	Illustrate the techniques of isolation, fractionation and separation of cellular constituents.	4,3	Applying
CO-3	Relate the various spectroscopic techniques.	4,2	Analyzing
CO-4	Evaluate projects using gained knowledge through research and project writing methods.	5,1	Evaluating
CO-5	Prepare and present research papers in seminar, conferences and writing scientific paper in research journals.	5	Creating

Relationship Matrix

Semester	Course Code	Title of the Course				Hours	Credits			
III	21PCMB33	RESEARCH METHODOLOGY AND BIOSTATISTICS				75	4			
Course Outcomes (COs)	Programme Learning Outcomes (PLOs)					Programme Specific Outcomes (PSOs)				
	PLO 1	PLO 2	PLO 3	PLO 4	PLO 5	PSO 1	PSO 2	PSO 3	PSO 4	PSO 5
CO-1	✓	✓		✓	✓		✓	✓	✓	✓
CO-2	✓	✓		✓	✓	✓	✓		✓	✓
CO-3	✓			✓	✓	✓		✓	✓	✓
CO-4		✓		✓	✓	✓	✓			✓
CO-5	✓	✓		✓	✓		✓	✓		✓
	Number of matches (✓) = 36 Relationship = High									

