

RESEARCH METHODOLOGY AND BIOSTATISTICS

Semester	Subject Code	Category	Lecture		Theory		Practical	Credits
			Hrs/ week	Total Hours/ Semester	Hrs/ week	Total Hours/ Semester		
IV	21CPZO4A	Core-X	6	90	5	90	Nil	5

COURSE OBJECTIVES

- To acquire the knowledge of the Chromatography, spectroscopy
- To understand the Preparation of manuscripts and collection of data.
- To imbibe the knowledge and analysis of statistical data .

COURSE OUTCOMES:

On the successful completion of the course, students will be able to:

CO Number	CO Statement	Knowledge Level (K1-K4)
CO1	The main objectives of this paper is to understand the state of art of the instruments.	K2
CO2	To understand the introduce in principles and methods of various instruments used in biology	K2
CO3	It also helps to acquire knowledge on the preparation of research manuscripts etc	K4
CO4	To imbibe the knowledge and analysis of biological data.	K4
CO5	To apply and analyze the test of significance.	K3 & K4

Knowledge Level : K1-Remember ; K2 –Understand ; K3 – Apply ; K4 – Analyze

MAPPING WITH PROGRAMME OUTCOME:

COS	PO1	PO2	PO3	PO4	PO5
CO1	M	S	M	S	S
CO2	M	M	S	S	M
CO3	S	S	M	M	S
CO4	M	S	M	S	M
CO5	S	M	S	M	S

S-Strong; M-Medium; L- Low

DISTRIBUTION OF MARKS: THEORY 55% AND PROBLEM 45%

UNIT-I CONCEPTS OF RESEARCH

18 Hours

Meaning, Objectives, Motivation and Approaches, Types of Research (Descriptive / Analytical, Applied / Fundamental, Quantitative / Qualitative, Conceptual / Empirical, Research Methodology). Research methods Vs Research Methodology.

Research Design- Definition-Characteristics and Types of research design.

UNIT-II RESEARCH FORMULATION

18 Hours

Observation and Facts, Prediction and explanation, Induction, Deduction. Defining and formulating the research problem, Selecting the problem and necessity of defining the problem.

Literature review - Importance of literature reviewing in defining a problem, Critical literature review, Identifying gap areas from literature review, Hypothesis - Null and alternate hypothesis and testing of hypothesis.

UNIT-III RESEARCH REPORTS AND IPR

18 Hours

Effective technical writing of a report, research paper and review paper. Preparation of a Research Proposal, Format of research proposal, a presentation and assessment by a review committee. Academic Writing Tools and Research Software.

Nature of Intellectual Property: Patents, Designs, Trade and Copyright. Process of Patenting and Development: technological research, innovation, patenting, development. International Scenario: International cooperation on Intellectual Property. Procedure for grants of patents, Patenting under PCT.

UNIT-IV BASICS OF BIOSTATISTICS

18 Hours

Introduction to Statistics – Data Collection: Sources of Data – Primary Data – Secondary Data - Procedure Questionnaire – Sampling Methods – Merits and Demerits – Experiments – Observation Method – Sampling Errors - Type-I Error & Type-II Error.

UNIT-V STATISTICAL ANALYSIS

18 Hours

Probability Theories – Conditional Probability, Poisson Distribution, Binomial Distribution and Properties of Normal Distributions – Hypothesis Testing –Sampling Distribution-Level of Significance. Correlation—Types of Correlation- Standard Deviation – Co-Efficient of Variations -Chi-Square Test-. Introduction to SPSS.

TEXT BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Bailey, N.T. J	Statistical Method in Biology	The English Language book society and English University Press Ltd	1959
2.	Ipsen, J. and Feigl, P	Bancroft's Introduction to Biostatistics	Harper and Row Publishers, New York, London.	1970
3.	Snedecor, G. W. & William, G.	Statistical methods	Harvard University, Oxford & IBH Publication Co., Calcutta. Bombay, New Delhi	1975
4.	Sokal, R, and James, F.R.	Introduction to Bio-statistics	W.H. Freeman & Company, Toppan company, Ltd., Tokyo, Japan.	1973
5.	Anderson, Durston and Polle.	Thesis and Assignment writing	Wiley Eastern Ltd., New Delhi.	1970
6.	Comir and Peter Wood Ford	Writing scientific papers in English	Pitman Medical Publishing Co., London.	1979
7.	Palanichamy, S. and M. Shanmugavelu	Research methods in biological sciences	Palani Paramount Publications, Tamil Nadu, India.	1997

REFERENCE BOOKS

S.NO	AUTHORS	TITLE	PUBLISHERS	YEAR OF PUBLICATION
1.	Deepak Chawla , Neena Sondhi	Concepts and Cares	2 nd Edition Vikas Publications	2017
2.	Dr. Vijay & Shende Arvind	Research Methodology	S. Chand Publications	2010
3.	Pranab Kumar Banerjee	A Textbook Of Biometry	S.Chand Publication	2007

4.	Orlando Wayne	A Step By Step Approach To Biostatics	Kindle Editions Publications	2017
5.	Day, R.A	How to write and publish a scientific paper	Cambridge University Press, London.	1994

WEB SOURCES:

www.sciencemag.com

www.treehugger.com

www.nature.com

TEXT BOOKS

- Home test
- PPT Presentations
- Demonstration from the Video slides, videos and interactive software.

SYLLABUS DESIGNERS

- Dr D.Sasikala, Assistant Professor & HOD
- Dr.V.Kiruthiga, Assistant Professor
- Dr V.Rekha, Assistant Professor
- DrA.Vinodhini, Assistant Professor
- Dr.G.Vidhya, Assistant Professor
- Dr. S. Vijayakumari, Assistant Professor