

INTERNSHIP PROGRAMME FOR UG DEGREE (SEMESTER-V)

(For the students admitted under New Curriculum and Credit Framework from the academic session 2023-24)



Course Title: Research Methodology	
Internship Providing Organization (IPO):	Department of Microbiology, Bankura Sammilani College
Category of Course:	For UG DEGREE (SEM-V)
Duration:	60 Hours
Course Coordinator and Contact Details:	Mr. Sourav Singha Mobile No: 9434484476
Mentor:	Dr. Arindam Ganguly
Intake Capacity:	70 Students
Course Fees:	Rs. 200/- (Students from Host Institution) Rs. 400/- (Students from Other Institution)

SYLLABUS

Course Title: Research Methodology [50 Marks/2 Credits/60 Hours]

Learning Outcomes (LO)

- Understand the research process from problem identification to selecting appropriate research designs, including forming hypotheses.
- Develop skills in literature review and reference management, using digital tools such as Google Scholar, PubMed, Zotero, or Mendeley.
- Gain practical knowledge of sampling techniques and data collection methods, tailored to undergraduate-level scientific projects.
- Learn to analyze and interpret data using basic statistical tools like MS Excel, SPSS, and ANOVA, along with creating graphs and visualizations.
- Acquire proficiency in digital tools such as MS Word, Excel, PowerPoint, and Open Office for preparing professional research documents and presentations.
- Enhance scientific communication skills by writing structured reports, synopses, and presenting research findings effectively in academic settings.

MODULE-I (Theory)

Unit 1: Foundations of Research [6 Hours]

Meaning, Objectives, Motivation, Utility. Concept of theory, empiricism, deductive and inductive theory. Characteristics of scientific method – Understanding the language of research – Concept, Construct, Definition, Variable. Research Process.

Unit 2: Problem Identification & Formulation [6 Hours]

Research Question – Investigation Question – Measurement Issues – Hypothesis – Qualities of a good Hypothesis – Null Hypothesis & Alternative Hypothesis.

Unit 3: Research Design [8 Hours]

Definition – essentials and types of research design – errors and types of errors in research design. Research problem: Selecting and analysing the research problem – problem statement formulation – formulation of hypothesis. Literature review: purpose, sources, and importance - literature review procedure. Formulation of the research objectives.

Unit 4: Sampling [10 Hours]

Concepts of Statistical Population, Sample, Sampling Frame, Sampling Error, Sample Size, Non Response. Characteristics of a good sample. Probability Sample – Simple Random Sample, Systematic Sample, Stratified Random Sample & Multi-stage sampling. Determining size of the sample – Practical considerations in sampling and sample size.

MODULE-II (Practical)	
Unit 1: Computer Application in Research:	[8 Hours]
Introduction to MS Excel, Using Formulas and Functions, Features for Statistical Data Analysis, Generating Charts/Graphs, Introduction to MS Word, Features and Functions, Writing Report in MS Word, Introduction to Open Office. Creating Presentations in MS Power Point.	
Unit 2: Advanced Research Techniques	[6 Hours]
Web based literature search tools. Retrieval & Exploration of Data through advanced database, Exploration of Google scholar and PubMed Central. Bibliography Management (Zotero/Mendeley).	
Unit 3: Research Analysis tools	[6 Hours]
Digital Documentation, Statistical tools (SPSS & ANOVA), Data visualization & analysis tools.	
Unit 4: Report Writing	[10 Hours]
Types of Reports - Planning of Report Writing - Research Report Format - Principles of Writing of Report - Preparation of Manuscript for Publication of Research, Writing a Research Synopsis or Review Paper.	

Reference Books
<ol style="list-style-type: none"> (1) Creswell, J.W. and Creswell, J.D., 2017. Research design: Qualitative, quantitative, and mixed methods approach. Sage publications. (2) Kothari, C.R., 2004. Research methodology: Methods and techniques. New Age International. (3) Krishnaswamy, K.N., 2006. Management Research Methodology: Integration of Principles, Methods and Techniques. Pearson Education India. (4) Sekaran, U. and Bougie, R., 2016. Research methods for business: A skill building approach. John Wiley & Sons.