

Subject Code: 2SC2010403	Subject Title: Research Methodology and Research Writing
COURSE TYPE: CORE COURSE	

Course Objective: For a student of biological sciences, conducting value-research and writing great research report, is utmost important. This course offers value to the students' arsenal before starting his/her research on a particular topic. Research writing is also covered in great depth with special emphasis on writing for paper and poster presentations.

Teaching scheme (hours) per week		Credit			Theory Marks		Practical Marks		Total
Theory	Practical	Theory	Practical	Total	Uni. Assessment	Cont. Assessment	Uni. Assessment	Cont. Assessment	
4	-	4	-	4	60	40	-	-	100

Unit	Content	Lectures	Weightage
1	Unit 1: Research Fundamentals and Basic Terminology ✓ Meaning and Objective of research, features of a good research study, scientific method ✓ Study designs and variations: basic, applied, historical, exploratory, experimental, diagnostic research, multifactorial design	12	20%
2	Unit 2: Defining Research Problem and Data Collection ✓ Hypothesis, theory and scientific law: development, structure, conditions, sources, formulation, explanation of hypothesis; structure, identification, elements, classification, functions of theory; scientific laws and principles ✓ Methods and techniques of data collection: types of data, methods of primary data collection(observation/ experimentation/ questionnaire/ interviewing/ case/ pilot study , methods), methods of secondary data collection(internal/ external)	15	25%
3	Unit 3: Sampling and Sampling Distributions ✓ Sampling frame, importance of probability sampling, simple random sampling, systematic sampling, stratified random sampling, cluster sampling, problems due to unintended sampling, ecological and statistical population in the laboratory ✓ Variables: nominal, ordinal, discontinuous, continuous, derived	15	25%
4	Unit 4: Data Analysis and Research Writing ✓ Experimental data collection and data processing: Processing operations, problems in processing, elements of analysis in data processing, Analysis of variance (One-way ANOVA and two-way ANOVA), Student's t-test ✓ software for data processing ✓ Scientific writing and presentations	18	30%

Learning Outcome: Students will learn in great detail the core aspects of conducting as well as documenting their research.

Reference Books:

1. Kothari, C.R., 1985, Research Methodology- Methods and Techniques, New Delhi, Wiley Eastern Limited.
2. Das, S.K. , 1986, An Introduction to Research, Kolkata, Mukherjee and Company Pvt. Ltd.
3. Misra R.P., 1989, Research Methodology: A Handbook, New Delhi, Concept Publishing Company
4. Kumar, R., 2005, Research Methodology-A Step-by-Step Guide for for Beginners, (2nd.ed.), Singapore, Pearson Education.
5. Bhattacharya, D.K., 2006, Research Methodology, (2nd.ed.), New Delhi, Excel Books.
6. Panneerselvam R., 2012, Research Methodology, New Delhi, PHI Learning Pvt. Ltd.
7. Khan, Irfan Ali, 2008, Fundamentals of Biostatistics, Ukaaz Publications
8. Rosner B.A., 2011, Fundamentals of Biostatistics, Cengage Learning
9. Katz J.M., 2009, Form Research to Manuscript: A guide to scientific writing, USA, Springer Science
10. Saravanavel, P. 1990. Research methodology. Allahabad, Kitab Mahal