

Subject Code: 2SC2020401	Subject Title: Research Methodology
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 ✓ Meaning of Research, Objectives of Research, Motivation in Research ✓ Basic types of Research: Descriptive, Analytical, Applied, Fundamental, Quantitative, Qualitative, Conceptual, Empirical, Clinical, Laboratory, Historical research ✓ Significance of Research ✓ Research methods vs. methodology ✓ Research and Scientific method ✓ Research process ✓ Criteria of good research ✓ Problems encountered by Researchers in India	15	25%
2	Unit 2: Research Problem and Data Collection ✓ Meaning of Hypothesis and its characteristics ✓ Nature, function and importance of hypothesis ✓ Basic concepts concerning testing of hypothesis ✓ Procedure for Hypothesis testing ✓ Introduction to research problem ✓ Techniques involved in defining a problem ✓ Meaning of data and needs for data collection ✓ Methods of primary data collection (Observation, Interviewing, questionnaire, schedule, and other methods) ✓ Methods of secondary data collection: Characteristics, Selection of appropriate method, Case study method	15	25%

3	Unit 3: Research planning and Sampling ✓ Meaning and need for Research design ✓ Features of good research design ✓ Category of research design ✓ Design format for a research proposal ✓ Concept of Sampling ✓ Steps in sample design ✓ Types of sampling design: Probability sampling, Nonprobability sampling ✓ Criteria in selecting sampling procedure ✓ Characteristics of good sample	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, software for data processing ✓ Significance of report writing ✓ Different steps in writing report ✓ General format of research report ✓ Types of reports ✓ Mechanics of report writing ✓ Precautions for writing research reports ✓ Poster and oral presentations	15	25%

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