Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NCYC595	Research Methodology and statistics	3	0	0	3

Course Objective
• Introduce the ethics of research, literature survey, designing a research scheme, execution, data handling, writing a research manuscript
Learning Outcomes
• To identify the do's and don'ts of research work • How to do literature survey and defining a research problem • Design a research scheme, do data handling and file patents

Unit No.	Topics to be Covered	Lecture Hours	Learning Outcome
1	Introduction to Research Methodology, Philosophy of Research, Ethics in Research, Conceptualizing, Literature Survey and defining the research problem. Evaluation of Research. Plagiarisms.	8L	Overview of various steps involved in research and ethics involved in research
2	Research Design, Sampling Design, Measurement and Scaling Techniques, Methods of Data Collection, processing and Analysis of Data, Sampling Fundamentals, Practical Aspects of Chemical Analysis.	12L	Learn different methods of data collection and analysis depending on research problem
3	Tools and Techniques for scientific writing, writing a Research Paper, Preparing a Manuscript for Submission, Fundamental of patent filling.	12L	Discussion on how to write research paper and file patents
4	Handling of air and moisture sensitive compounds, dry box, glove box, Schlenk line and vacuum line techniques and Fume Hood. General procedures for handling all chemicals in addition to specific procedures for chemical hazard groups (Toxins, Flammables, Carcinogenic, Corrossives, Compressed Gases, Peroxide Formers, Reactive chemicals).	10L	Learn about handling of sensitive compounds and precautions to be adopted while using different chemicals
	Total	42L	

Text book:

1. Research-Methodology: Methods-and-Techniques by C.R. Kothari, New age international (p) limited, 2004.

Reference books:

1. Research Methods Knowledge Base by William Trochim, Atomic Dog; 3rd edition, 2015.
2. From Research to Manuscript: A Guide to Scientific Writing by Michael Jay Katz, Springer, 2006.