

Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NCSC595/NCSC596	Research Methodology	3	0	0	3

Course Objective

- To provide a formal guideline to students for carrying out research.
- To train the students about various statistical and mathematical tools and techniques essential for research.
- To teach methods of data collection, interpretation, drawing conclusions, and validating proposed models.
- To train students in ethical research practices for societal and human welfare.
- To prepare students for research article/document preparation and presentation.

Learning Outcomes

- Gain deep insights into research methods, enhancing quality in academic and international research work.

Unit No.	Topics to be Covered	Lectures	Learning Outcome
1	Introduction: objectives, motivation, significance, approaches, ethics (plagiarism and testing for plagiarism), responsibilities, developing skills for individual/group research, art of paper presentation/seminar presentation, steps of organizing research programs/workshops/courses /conferences	5	Inculcate research responsibilities and organizational skills.
2	Research problem identification and literature survey.	3	Equip students to initiate problem search effectively.
3	Data handling techniques: Importance of data, data understanding, methods of data collections, data pre-processing techniques. Popular/conventional tools and techniques for data pre processing/ processing (dimensionality reduction, outlier removal), statistical methods (central tendency, dispersion, correlation regression, probability and probability distribution, sampling theory, test of significance, analyses of variance, multi-variate statistics)	20	Master quantitative research tools and techniques.

Unit No.	Topics to be Covered	Lectures	Learning Outcome
4	Documentation: Report writing, power point presentation techniques/styles, paper writing (title, abstract, key words, literature survey, preparing tables, charts, bar diagrams, graphs, plotting curves, surface plots, presenting equations, theorems, schematic diagrams, presenting experimental results, comparative discussions, performance rating, bibliographic referencing etc).	10	Learn appropriate presentation methods for research findings.
5	Roles/responsibilities of researchers towards research work, laboratories, Institute, co-workers, role of legacy, continuation of research activities, adaptation with the current trends and state-of-the arts.	4	Understand professional and ethical responsibilities in research.

References

Textbooks:

- Research Methodology Methods and Techniques by C.R. Kothari, New Age International.
- Research Methodology by G.C. Ramamurthy, DreamTech.
- Statistical Methods by N.G. Das, McGraw Hill.

Reference Books:

- Research Methodology: The Aims, Practices, and Ethics of Science by Peter Pruzan, Springer.

Project (literature Survey -20 %)	Mid Sem (32 %)	End Sem (48 %)
by 15th April 2025	As per Schedule	As per Schedule