Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NCEC595	Research Methodology	3	0	0	3

Course Objective

The course aims to impart an understanding of the fundamentals of research methodology and statistical methods.

Learning Outcomes

Upon successful completion of this course, the students should be able to:

- Know the basics of research methodology
- Apply standard statistical methods for various research problems

Unit No.	Topics to be Covered	Contact Hours	Learning Outcome
1	**Fundamentals:** Introduction to research, Research process, Types of research, Phases of research process, Presenting and publishing research findings, Report preparation, Plagiarism	7L	To know the fundamentals of a research process
2	**Research design and data handling**: Basic principles of experimental design, Problem identification and hypotheses formulation, Sampling design, Measurement and scaling, Methods of data collection, Reliability and validity	7L	To understand the techniques of research design and data handling
3	**Introduction to Probability and statistics:** Fundamentals of probability, Fundamentals of statistical analysis, Data description, Frequency distribution, Measures of central tendency, Measures of dispersion, Skewness, Kurtosis, Concept of moments	10L	To know the measures of descriptive statistics.
4	**Probability distributions of discrete and continuous random variables:** Bernoulli Binomial, Geometric, Poisson, Negative Binomial, Uniform, Normal, Lognormal,	5L	To understand the different types of discrete and continuous probability distributions

	Exponential, Triangular, Gamma, Extreme value distributions		
5	**Sampling distribution and Hypotheses testing:** Sampling distribution, t test, z test, Chi-square test, Analysis of variance, regression	10L	To understand the concept of sampling distribution and the different types of hypothesis testing
	Total Contact Hours	**42L**	

Text Books:

1. Kothari, C.R. and Garg, G. (2019) , Research Methodology : Methods And Techniques, New Age International Publishers.
2. Johnson, A. (2011), Miller and Freund's - Probability and Statistics for Engineers, PHI.

Reference Books:

1. Ayyub, B. M., & McCuen, R. H. (2016). Probability, statistics, and reliability for engineers and scientists. CRC press.