Course Type	Course Code	Name of Course	L	T	P	Credit
DC	NGPC595	Research Methodology	3	0	0	3

Course Objective

Fundamental knowledge on research activity. Analysis of research based on Geophysical dataset Classification of various research and thorough idea on quantitative research. Statistics and its uses on researches along with various distributions of statistics and uses of these distributions. Presentation of research outcome and its publication. Ethics behind research publication.

Learning Outcomes

The aim of the course is to provide participants with an introduction to research methods, statistics and writing of research outcome. Develop understanding on various kinds of research, objectives of doing research, research process, research designs and sampling. Have basic knowledge on qualitative and quantitative research techniques Have adequate knowledge on measurement & scaling techniques as well as the quantitative data analysis of various geophysical data. Have basic awareness of statistics and data analysis and its procedures. Adequate knowledge on the detail and ethical process of research publication.

Unit No.	Details of Lectures	Lecture Hrs.	Outcome
1.	**Introduction to Research** • Definition of Research, Invention and Discovery • Precision, validity, coverage and completeness of geophysical dataset and their analysis • Data resolution, detectability, and error estimation in geophysical analysis	9	Introductory idea about research and its relation with Geophysics.
2.	**Introduction to Quantitative Research** • Qualitative and Quantitative methodologies • Advantages and disadvantages of quantitative methods and its applications • Components of quantitative approaches. • Quantitative interpretation over various scales, and its implications. • Understanding and implications of global, regional and local dataset.	9	Quantitative research and its outcome on various dataset.
3.	**Statistics** • Frequency distribution of a dataset and its classification. • Frequency distribution curves. • Correlation analysis. • Central tendency analysis, Dispersion and Skewness. • Kurtosis and Moments and its implication for frequency distribution curve. • Regression analysis. • Error estimation. • PDF and CDF and its implication. • Binomial PDF. • Data sampling, aliasing • Poisson and Normal distribution.	15	Introduction to statistics; how statistics can be used for research and different types of distributions.

	• Variance and Standard deviation. • Chi-square test, t-test, z-test for data analysis.		
4.	**Data presentation and technical writing** • Data presentation and publication. • Preparation and presentation of technical literatures. • Writing a research proposal. • Writing a research paper. • Published literature, Research Ethics and Plagiarism.	**9**	Research output presentation & publication; ethics of publications.
		42	

Text Books

1. Akaninwor, G. I. K., 2006, A Handbook On Research Methods and Statistics
2. Shukla, S., 2018, Research Methodology and Statistics
3. Beins, B.C., and McCarthy, M.A., 2012, Research Methods and Statistics

Reference Books

1. Jackson, S.L, 2010, Research Methods and Statistics
2. Hanneman R. & Kposowa A. and Riddle M., 2004, Research Methods for the Social Sciences: Basic Statistics for Social Research