

Curriculum Development Plan: Prof. Monika Bassi
B.Sc. (H) Physics, Third Year, Semester V, NEP-UGCF
(Odd Semester, 2026-2027)
No. of Theory Periods per week = 2

Name of Paper & Code	Allocation of Lectures	Month-wise schedule followed by the Department	Tutorial/assignment/ Presentation etc.
Research Methodology			
Unit I: Introduction to Research Methodology Brief history of scientific method and research, role and objectives of research, basic tenets of qualitative research; research problem and review of literature: identifying a research problem (philosophy and meaning of research, identification and definition of research problem, formulation of research problem, sources of prejudice and bias); literature survey (open-source and paid tools for keeping track of the literature)	6 Hours	July-August	• Syllabus Overview • Reference Books • Research Problem Identification and Formulation • Literature Review and Literature Search • Assignments • Previous Years' Question Papers / Problems • Students' Difficulties
Unit II: Data collection, analysis and interpretation Methods of data collection: survey, interview, observation, experimentation and case study; Descriptive statistics: Measures of central tendency (mean, median, mode) and dispersion (range, standard deviation); Inferential statistics: Hypothesis testing, Z test, T test; regression	15 Hours	October-November	• Data Collection Exercises • Statistical Problem Solving • Assignments • Students' Difficulties • Class Test • Previous Years' Question Papers / Problems

analysis (basic concepts of multiple linear regression analysis and theory of attributes); Curve fitting using linear and nonlinear regression (parameter space, gradient search method and Marquardt method); Role of simulation, calibration methods, error analysis, and background handling in experimental design			• Discussion of Last Year's Examination Papers • Tips for Final Examinations
Unit V: Scientific Writing and Software Tools Writing a research paper and report: introduction, motivation, scientific problem, its methodology, any experimental setup, data analysis, discussion of results, conclusions Referencing formats (APA, MLA) and bibliography management Graphical software (open source, magic plot, gnu plot, origin); presentation tools (beamer)	5 Hours	August	• Research Paper / Report Writing Exercises • Referencing and Bibliography Exercises • Software Demonstration and Practice • Assignments • Students' Difficulties • Class Test • Previous Years' Question Papers / Problems
Unit VI: Intellectual Property Right and Research Funding Basic concepts and types of intellectual property (patent, copyright and trademark) Role of funding agencies in research, overview of various funding agencies (DST-SERB, UGC, CSIR, BRNS, DRDO), national and international research project grants and fellowships	4 Hours	September	• Case Studies on Intellectual Property Rights • Research Funding and Fellowship Discussion • Assignments • Revisions • Practice Examinations • Discussion of Last Year's Examination Papers • Tips for Final Examinations