# Research Methodology
# Syllabus for Ph.D. Entrance Exam 2025

**Unit-I Research Aptitude**

Research: Meaning, Types, and Characteristics, Positivism and Post positivistic approach to research. Methods of Research: Experimental, Descriptive, Historical, Qualitative and Quantitative methods. Steps of Research. Thesis and Article writing: Format and styles of referencing. Research ethics.

**Unit-II Mathematical Reasoning and Aptitude**

Types of reasoning. Number series, Letter series, Codes and Relationships.

Mathematical Aptitude (Fraction, Time & Distance, Ratio, Proportion and Percentage, Profit and Loss, Interest and Discounting, Averages etc.).

**Unit-III Logical Reasoning**

Understanding the structure of arguments: argument forms, structure of categorical propositions, Mood and Figure, Formal and Informal fallacies,

Uses of language, Connotations and denotations of terms, Classical square of opposition. Evaluating and distinguishing deductive and inductive reasoning. Analogies. Venn diagram: Simple and multiple use for establishing validity of arguments.

**Unit-IV Data Interpretation**

Sources, acquisition and classification of Data. Quantitative and Qualitative Data. Graphical representation (Bar-chart, Histograms, Pie-chart, Table-chart and Line-chart) and mapping of Data. Data Interpretation. Data and Governance.

**Unit-V Information and Communication Technology (ICT)**

ICT: General abbreviations and terminology. Basics of Internet, Intranet, E-mail, Audio and Video-conferencing. Digital initiatives in research. ICT and Governance. Application of ICT in research.

**Unit-VI People, Development and Environment**

Development and environment: Millennium development and Sustainable development goals. Human and environment interaction: Anthropogenic activities and their impacts on environment.

Environmental issues: Local, Regional and Global; Air pollution, Water pollution, Soil pollution, Noise pollution, Waste (solid, liquid, biomedical, hazardous, electronic), Climate change and its Socio-Economic and Political dimensions. Impacts of pollutants on human health. Natural and energy resources: Solar, Wind, Soil, Hydro, Geothermal, Biomass, Nuclear and Forests. Natural hazards and disasters: Mitigation strategies.