

## 202B Research Methodology for Business And Industrial Operations Research

Unit No.	Unit Title	Contents
1	Introduction to Business Research	Introduction. Definition, Objectives, Significance & Types of Research, Criteria of research, Features of a Good Research, Steps in Scientific Research Process, Research Methods versus Methodology <b>Ethics and Modern practices in Research:</b> Ethical Issues in Research – Plagiarism, Role of Computer in Research, Application of Statistical software- Introduction to SPSS
2	Formulation of the Research Problem, Development of the Research Hypotheses, Research Design & Sampling	<b>Research Problem:</b> Defining the Research Problem, Techniques involved in Defining Research Problem <b>Review of Literature</b> <b>Hypotheses:</b> Meaning, Definition & Types of Hypothesis, Formulation of the Hypotheses, Methods of testing Hypothesis <b>Research Design:</b> Meaning, Nature & Classification of Research Design, Need for Research Design, Phases/Steps in Research Design <b>Sampling:</b> Meaning & definition of Sampling, Key terms in Sampling, Types of Sampling: Probability & Non-probability, Sampling Errors
3	Data Collection, Measurement & Scaling, Processing of Data: Sources of Data Collection:	<b>Primary Data:</b> Methods of Data Collection, Merits & Demerits <b>Secondary Data:</b> Internal & External Sources of Data Collection Factors influencing choice of method of data collection Designing of a questionnaire – Meaning, types of questionnaire, Stages in questionnaire designing, Essentials of a good questionnaire, Schedule <b>Measurement &amp; Scaling:</b> Meaning & Types of Measurement Scale, Classification of Scales <b>Processing of Data:</b> Editing, Coding, Classification & Tabulation. <b>Analysis &amp; Interpretation of Data:</b> Types of Analysis, Univariate, Bivariate and Multivariate Analysis of Data
4	Research Report and Mode of Citation & Bibliography:	<b>Research Report:</b> Importance of Report Writing, Types of Research Reports, Structure or Layout of Research Report <b>Mode of Citation &amp; Bibliography:</b> Author, Date, System, Footnote or Endnote System, Use of Notes. Position of Notes, Citing for the first time, Subsequent Citing, List of Abbreviation used in Citation, Mode of preparing a Bibliography, Classification of Entries, Bibliography Entries compared with Footnotes, Examples of Bibliography Entries
5	Game Theory	Introduction, Characteristics of game theory, Two person zero sum game, Pay off and pay off matrix, saddle point, pure strategy, mixed strategy, value of game, Dominance Principle, Algebraic system of solving 2X2 Game, Numerical problems

6	Linear Programming Problem (L.P.P.)	Introduction, Advantages and Applications of L.P.P., Basic Definitions and Terminology, Formulation, Canonical and Standard forms, Slack, Surplus and Artificial variables, Solution by graphical method (for problems with two variables only), Solution by simplex method (canonical form and two iterations only), degenerate, alternate, unbounded and Infeasible solutions, Big M method, Formation of dual of a L.P.P. and relation between solution of primal and dual, Numerical problems
7	Transportation Problem (T. P.) and Assignment Problem	Definition, T.P. as L.P.P., balanced and unbalanced T.P., Methods of finding Initial Basic Feasible Solution (I.B.F.S.) - North – West corner method, Matrix Minima Method, Vogel’s approximation method, Optimal solution by U-V method, Maximization and degeneracy in T.P. Definition, balanced and unbalanced A.P., Hungarian method, Variations of A.P (maximization and restrictions), Numerical Problems
8	Project Management and Sequencing	Activity, Event, Loop, Network (definition and drawing), Critical Path Method(CPM): critical activity, critical path, float (free, independent, total), forward pass and backward pass calculations Programme Evolution and Review Technique PERT): optimistic, pessimistic, most likely time estimates, expected time estimate and its variance Numerical Problems
9	Sequencing Problems	Assumptions in sequencing model, Basic terminology, n-jobs through two machine problems.