

INDIAN INSTITUTE OF TECHNOLOGY MADRAS
Department of Management Studies
Subjects and Syllabus for Comprehensive Viva
Dhandabani S (MS18D201)

Research Methodology for Business and Management (MS 7080)

Instructor – Dr. Saji K Mathew

Approach to research – What is research? Researcher Bias, Fundamental vs Applied research Science of social science, Research paradigms in management research.

Foundations of theory – Theory in management research, Hypotheses and Propositions, Theory building, Epistemology and Ontology, Quantitative vs. Qualitative Research.

Qualitative research – Qualitative research in management, Different qualitative approaches, Validity and Reliability in qualitative research.

Quantitative research – Concepts, constructs and measurement, Scales of measurement, Survey-based research, and Experimental design.

Research design – Level of analysis and measurement, Experimental approach, Cross sectional design, Longitudinal design, Case study design.

Data Analysis for Research (MS6031)

Instructor – Dr. R K Amit

Primitives – Probability mass function, Probability density function, Cumulative density function, Mean, Mode and Median, Association between categorical variables, Covariance, Correlation, Characteristic function, Law of large numbers, Independent events, Conditional probability.

Probability distributions – Bernoulli, Binomial, Poisson, Normal, Chi-squared, *t*-distribution, *F* distribution.

Sampling – Estimators, Distribution of estimators (Sample mean and Sample variance), Bayes theorem and Maximum Likelihood estimators.

Confidence Intervals – Confidence interval for mean, Interpreting confidence intervals.

Hypothesis Testing – Null and Alternate hypothesis, Type 1 and Type 2 error, Neyman-Pearson lemma, Shadow price of statistical power, Tests for means and variances.

Microeconomics (MS5110)

Instructor – Dr. R K Amit

Primitives – Opportunity and Sunk costs, Average vs Marginal, Supply, Demand, Inverse demand functions, Notion of Equilibrium, Elasticity.

Modeling Costs – Production function, Total cost, Efficient scale of production, Technology, Isoquants, Isocosts, Returns to Scale, Economies of Scale, Cost Minimization: Optimal cycle inventory, Double marginalization.

Perfect Competition – Supply function, Equilibrium with perfectly competitive firms, Short run and Long run analysis, Market Efficiency, Deadweight loss.

Monopoly – Cost based vs Value based pricing, Lerner Index of Market power, Optimal price and quantity, Price discrimination, Revenue or Yield Management.

Competition – Primitives of Game theory, Nash Equilibrium, Homogeneous products Oligopoly: Cournot, Bertrand and Stackelberg models.

Risk and Information – Hidden information: Adverse Selection and Moral hazard, Auctions, Internet Advertising.

Game Theory for Business (MS5025)

Instructor – Dr. R K Amit

Primitives – Applications of Game theory: Contracts, Auctions and Resource sharing, Language of game theory: representation, strategies, payoffs, and game trees, Role of Communication

Reasonable outcomes in Game theory – Notion of strategy, Solving by dominance and backward induction, Nash equilibrium and its refinements, Bayesian equilibrium.

Designing Mechanisms – Fundamentals of mechanism design as game engineering, Dominant strategy implementation and Impossibility results, Designing auctions.

Coalitional-form games – Characteristic function, Shapley value, Core, Convex games.

Supply Chain Management (MS5330)

Instructors – Dr. Arshinder Kaur and Dr. Usha Mohan

Primitives – Evolution, Decision phase of supply chain, Process view of supply chain, Push/Pull view of supply chain, Supply chain drivers, Supply chain strategy.

Managing uncertainty and Inventory management – Single period inventory model, Multi-period inventory model, Measuring lead time and demand uncertainty, Risk pooling, Postponement.

Role of transportation in Supply chains – Trade-offs in network design, Drivers of Transportation decisions, Decision on mode of transportation, Distribution network design.

Value of information in supply chain and coordination – Bull whip effect: Causes, Quantifying and Mitigation, Information technology in supply chain.

Supply chain contracts – Buyback, Revenue sharing and Quantity flexibility contracts.