

Subjects and Syllabus for Comprehensive Viva

Pratyush Yadav (MS18D204)

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 (MS 6031)

Instructor - Dr. R. K. Amit

Introduction to Probability – Mean, Mode and Median, Probability mass function, Probability density function, Cumulative density function, Covariance, Correlation, Characteristic function, Law of large numbers, Independent events, Conditional probability.

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

Estimation – Estimators, Distribution of estimators (Sample mean and Sample variance), Bayes theorem and Maximum Likelihood estimators, Central Limit Theorem, Confidence Intervals – Confidence interval for mean

Hypothesis Testing – Tests for means and variances, Type 1 and Type 2 error, Neyman-Pearson lemma, Comparing means and variances for 2 samples

Predictive and Prescriptive Data Analytics (MS 6032)

Instructor - Dr. Nandan Sudarsanam

Introduction - Fitting Distributions to Data, Brief about Supervised, Unsupervised and semi supervised learning

Regression- Fitting lines, statistical inference, evaluating model fit, potential problems in regression and its fixes, choosing variables in regression

Supervised Learning Concepts - K Nearest Neighbour Approach, Bias Variance Dichotomy, Regularisation and Coefficient Shrinkage, Cross validation, Dimensionality Reduction - Principal Component Analysis and regression

Classification- Logistic Regression, Support Vector Machines, Linear Discriminant Analysis, Classification and Regression Trees, Ensemble techniques.

Unsupervised Learning- Clustering: Types of clustering and clusters, K-means and hierarchical clustering, cluster evaluation, Association Rule Mining.

Data Warehousing and Data Mining (MS6840)

Instructor - Dr. Saji K Mathew

DWDM Introduction - Business intelligence & business value, Business Intelligence Architecture, Multi-Tiered Architecture, OLAP, OLTP

Data Warehouse and OnLine Analytical Processing (OLAP) - Data warehouse, Data mart, Data Cube, Operations on Data cube- (Slicing, Dicing, Roll up, Pivot, Drill up/down), Cuboids Corresponding to the Cube, Conceptual Modelling of Data Warehouses, Data Warehousing Architecture

Data mining process - Statistical learning, Data Quality, Data pre-processing, Cross validation, Confidence interval

Classification - Trees Classification techniques, Scoring models, Evaluating a scoring model, Classifier performance, Decision Tree, Attribute selection method, Tree pruning, Ensemble methods

Cluster analysis - Proximity matrix, Agglomerative clustering, Choosing variables as bases, Measures of distance for Ordinal, Binary, Nominal, mixed type data Partition clustering Selection of Cluster size

Text mining - Natural Language Processing, Text Mining Process, Corpus preparation, Term-by- Document Matrix, Multi word features

Artificial Neural Networks (ANN) - The Neuron, Perceptron, Gradient Descent, ANN Training, Feed forward neural network topologies, Components of Time Series, Model performance & prediction errors

Information Systems Analysis (MS5561)

Instructor - Dr. Nargis Pervin

Intro to Information Systems- Managing Information Systems Project, Introduction to SDLC phases, Software development models and processes

Planning: Selecting and Identifying projects - CPM, PERT, crashing a project, Application of multi criteria decision making in project selection - AHP, TOPSIS, Option thinking in project management

Determining System Requirements- Process modelling using Data Flow Diagrams, E-R modelling and Entity Relationship Diagrams

Database Design and Normalisation - Modelling, Relationship Sets, Attributes and types, Mapping Cardinalities, Keys for Relationship Sets, Normalisation, Normal forms, Functional Dependencies

Design patterns- Design patterns in OOP, types of Patterns