

Syllabus for One Semester Ph. D. Course Work

RESEARCH METHODOLOGY (RCW – I)

(Common for all disciplines)

Time: 3 Hrs.

Max. Marks 100

Note: (i) Eight questions will be set out of which the student shall be required to attempt to five questions. (ii) All questions carry equal marks.

Research

- Objective, Types of research, process and steps in it. Research proposal and concept.
- Research Design- meaning, need, concept and different research designs. Literature survey and review, research design process and error in research.
- Research Modeling- Types of Models, Model building and stages, Data consideration and testing (Sampling, Collection and Analysis), Heuristic and Simulation.

Design of Experiments

- Objectives, strategies, Factorial experimental design, Designing engineering experiments, basic principles- replication, randomization, blocking, guidelines for design of experiment.
- Analysis of variance- ANOVA- Basic principle, One way and Two way technique.
- Analysis of Co-variance- ANOCOVA technique.

Report writing and Interpretation

- Pre- writing considerations. Meaning and technique of interpretation.
- Different steps in report writing, Formats of report writing, Thesis writing, Formats of publication in Research journals.

Spreadsheet Tool

- Introduction to spreadsheet application, features and function
- Using formulas and functions, Data storing
- Features for statistical data analysis, Generating charts/ graph and other features.
- Tools used may be Microsoft Excel, Open office or similar tool.

Presentation Tool

- Introduction to presentation tool, features and function.
- Creating presentation, Customizing presentation, showing presentation.
- Tools used may be Microsoft power Point, Open office or similar tool.

Writing Tool

- M.S.Word
- PDF format
- LaTeX

Web Search

- Introduction to Internet, Use of internet and WWW, Using search engine like Google, Yahoo etc.
- Using advanced search techniques.

References:

1. Montgomery, Douglas C.(2007)5/e, Design and Analysis of Experiments.(Willey, India)
2. Kothari, C. R. (2004). 2/e, Research Methodology- Methods and Technique.(New Age International, New Delhi)
3. Montgomery, Douglas C. and Runger, George C. (2007), 3/e. applied statistics and probability for Engineers. (Willey, India)
4. The complete reference Office Xp- Stephan L. Nelson, Gujulia Kelly (TMH)

5. A document preparation system, User's guide and reference manual- Leslie Lamprot. (Addison-Wesley Pub.Co.)



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper CS-I

Code: RCWCS1

Time: 3 Hrs

Max. Marks 100

Note: (i) All Question carry equal marks (ii) Attempt any five question.

Introduction to Data Mining, Major Issues in Data Mining, Applications of Data Mining, Social impacts of data mining. Data Preprocessing, Data warehousing, Data Mining primitives, Association Rule Mining. Classification and Predication, Cluster Analysis, Mining complex Types of data.

Web Scale AI and Big Data, Web Intelligence, Big Data, Indexing, Ranking, Page Rank Searching, Searching structured data. Databases and their Evolution, Big data Technology and Trends. Classification, Clustering, and Mining, Information Extraction in Big Data. Forecasting, Neural Models, Deep Learning, and Research Topics. Data Analysis: Regression and Feature Selection.

Reference Books:

- Data Mining concepts and Techniques by Jiawei Han, Micheline Kamber –Elsevier.
- The Intelligent Web: Search, Smart Algorithms and Big Data published by Oxford University Press, UK, in November 2013, authored by Dr. Gautam Shroff.



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper CS-II

Code: RCWCS2

Time: 3 Hrs

Max. Marks 100

Note: (i) All Question carry equal marks (ii) Attempt any five question.

Introduction to distributed technologies like Grid Computing, Cloud Computing etc. Architectural models for distributed and mobile computing systems. Basic Concepts in Distributed Computing such as clocks, Message ordering, Consistent global states, and consensus. Basic Algorithms in Distributed Environment. Synchronous and Asynchronous distributed computing. Memory Management in Distributed Environment.

Evolution of computing paradigms, Introduction to virtualization and virtual machine. Cloud Computing: History, Cloud Service Models.

Internet History, Technology, and Security, Information System Security, Introduction to the Concepts of Security, Security Mechanism. Concepts of Grid Computing, Grid Architecture, Grid Security Demands and Solutions.

Cybersecurity and the Internet of Thing, IoT and the Industrial Sector, IoT and the Connected Home, IoT and Consumer Wearables.

Reference Books:

- Cloud Computing: A Practical Approach – Toby Velté, McGraw Hill.
- Tannenbaum, A, Van Steen. Distributed Systems, Principles and Paradigm, Prentice Hall India, 2002
- Nancy Lynch, "Distributed Algorithms" Morgan Kaufmann
- Atul Kahate "Cryptography and Network Security" Tata McGraw-Hill
- Ian Foster and Carl Kesselman."The Grid: Blueprint for a New Computing Infrastructure", Morgan Kaufmann.



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper CS-III

Code: RCWCS3

Time: 3 Hrs

Max. Marks 100

Note: (i) All Question carry equal marks (ii) Attempt any five question.

Artificial Intelligence: problem solving, planning, knowledge representation; pattern recognition; natural language understanding, computer vision, automatic programming, machine learning.

Neural Networks, Fuzzy Logic, Fuzzy Arithmetic, Introduction of Neuro-Fuzzy Systems,

Probabilistic Algorithm: Genetic Algorithm, Artificial Bee Colony Algorithm, Ant Colony Algorithm etc. Applications and implementations of probabilistic algorithm.

Reference Books:

- Elaine Rich, Kevin Knight, Shivashankar B. Nair, Artificial Intelligence (Third Edition), ata McGraw-Hill Education Pvt. Ltd.
- Vijay Lakshmi, Pai, Neural Networks, Fuzzy Logic and Genetic Algorithms, Soft Computing Paradigms, Prentice Hall of India (2008).
- Timothy Ross, Fuzzy Logic, Wiley India (2007) 2nd ed.
- F. O. Karray and C. de Silva, Soft computing and Intelligent System Design, Pearson, 2009.
- G.J. Klir & B. Yuan, Fuzzy Sets & Fuzzy Logic, PHI, 1995.
- Hertz J. Krogh, R.G. Palmer, Introduction to the Theory of Neural Computation, Addison-Wesley, California, 1991.



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper MECH-I

Code: RCWME1

Time: 3 Hrs.

Max. Marks :100

Note: (i) Eight questions will be set out of which the student shall be required to attempt to five questions (ii) All questions carry equal marks

Metal Machining - Modelling and control of Chip Formation, Machining of hard materials and metal matrix reinforced composites, Characterization and surface integrity in hard machining, Modern concepts of machining

Metal Forming:

Yield criteria, Slip line field theory, Temperature Field in Material.- Plastic and viscoplastic behaviour of material, Surfaces of Discontinuity, Numerical Models of Plasticity.

Advanced Machining Processes:

Hybrid electro-chemical processes, Hybrid thermal processes, Solid, liquid and powder based material addition processes (Analytical Study)

Reverse Engineering :

Reverse engineering – Methodologies and Techniques, Hardware and software, Rapid prototyping –Relationship with reverse engineering

Group Technology: Role of group technology in CAD/CAM integration, Methods for developing part families, Classification and coding, Examples of coding systems, Facility design using group technology, Benefits of G.T.

Computer Aided Process Planning: Role of Process Planning, Approaches to process planning- Manual, Variant, Generative approach; Examples of Process planning systems - CAPP, DCLASS, CMPP; Criteria for selecting a CAPP system, Benefits of CAPP.

Computer Integrated Manufacturing Systems: Types of manufacturing systems, Machine tools and related equipment, Material handling systems, Computer control systems, CIMS Benefits.

Quality Engineering in Manufacturing: Introduction – quality and improvement-objectives-quality assurance-quality systems-Economics – Statistical Tolerances – Quality loss function, Process variability- Charts for attributes, variables, moving average control charts

Reference Books:

1. Quality control –by Montgomery
2. Managing for total quality – by N. Logothetis
3. Quality planning and Analysis by Juran and Gryna

4. Computer Integrated Design and Manufacturing by David D. Bedworth, Mark R. Henderson, Philip M. Wolfe.
5. CAD / CAM by Groover & Zimmers (PHI)
6. Avitzur B., "Metal Forming - Process and analysis" Tata Mc-Graw Hill
7. Milton C Shaw, "Metal Cutting Principles" 2nd Edition, Oxford series in Advanced Manufacturing.



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Advanced Subject Paper MANAGEMENT-I

Code: RCWMGFN1

Time: 3 Hrs.

Max. Marks :100

Note: (i) Eight questions will be set out of which the student shall be required to attempt to five questions (ii) All questions carry equal marks

Fundamentals of Financial Management

Meaning, Scope, Function & Objective of Financial Management, Decision Making, Role of Financial Manager in a company. Financial statements and their analysis through Ratio analysis and cash flow analysis.

Statistical Methods

Meaning, scope and limitations of statistics. Measurement of Central tendency- Mean, Mode and Median. Measures of Dispersion- Mean Deviation and Standard Deviation. Meaning Significance and limitations of Correlation and Regression.

Financial System

Meaning and functions of financial system, financial concepts, financial assets, financial intermediaries, financial markets, financial rates of return and financial instruments.

Financial Decision Making

Capital Structure- Meaning, significance & factors affecting capital structure. Calculation of specific and weighted average cost of capital. Capital budgeting- decisions on the basis of traditional and discounted cash flow methods.

International Financial Management

International Accounting & International taxation including DTAA. Foreign Direct Investment- Advantages and Disadvantages. Risk Management through Future contracts, forward contracts and options.

References Books:

1. Prasanna Chandra, Fundamentals of Financial Management, Pearson Education.
2. M Y Khan, Financial Services, Tata Mc Graw Hill
3. V A Avadhani, Management of financial Services, Himalaya Publication
4. A K Seth, International financial Management.
5. P G Apte, International Financial Management, Tata Mc Graw hill



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper MANAGEMENT-II

Code: RCWMGHRM2

Time: 3 Hrs.

Max. Marks :100

Note: (i) Eight questions will be set out of which the student shall be required to attempt to five questions (ii) All questions carry equal marks

An overview of Human Resource Management: Importance and Functions, development of HRM, Personnel Management Vs. HRM, changing role of HRM, role and qualities of HR manager, challenges to HRM; Strategic HRM

Human Resource Planning: Objectives and Significance, Process, Job Analysis, Recruitment & Selection, Placement and induction, Training and development, Need assessment, Methods of training; Evaluation of training program

Organizational Change & Development: Motivation, Leadership Styles, Job Satisfaction, Organization Culture, Organizational Effectiveness; Organizational Development, Stress & Burn out; Quality of Work Life, Work Life Balance, Employee Engagement

Compensation Management: Job evaluation - Techniques, Wages and salary administration. Incentive payments, fringe benefits;

Performance appraisal: Objectives and techniques, Performance Management and Appraisal, Steps in appraising performance, Types of Appraisal, 360 Degree Feedback, Balanced Score Card; Career Planning and Development

Industrial Relations: Causes of Industrial Unrest and Remedial Measures, Industrial disputes in India, Trade Unionism in India, Social Security, Health & Welfare Measure in India

Grievance management, collective bargaining – Concept, Process; Pre-requisites; industrial democracy and employee participation, Objectives and forms of employee participation.

International Human Resource Management: Dynamics of HRM in Multinational Corporations, Cross Cultural HRM. Human Relations Challenges of the Future, workforce diversity management, talent management; Ethical Issues in Human Resource Management

Reference Books:

1. D'Ceazo, David A. and Stephan P. Robbins: Human Resource Management, John Wiley and Sons, New Delhi, 2011
 2. Flippo, Edwin B.: Principles of Personnel Management, McGraw Hill, New York.
 3. Bartlett, C.A, & Ghoshal,S. (1989): Managing Across Borders; The Transnational Solution. Boston: Havard Business School Press.
- Aswathappa. K., (2008) Human Resource management: Text and Cases, Tata McGraw Hill, New Delhi



Syllabus for One Semester Ph. D. Course Work

Advanced Subject Paper MANAGEMENT-III

Code: RCWMGMKT3

Time: 3 Hrs.

Max. Marks :100

Note: (i) Eight questions will be set out of which the student shall be required to attempt to five questions (ii) All questions carry equal marks

Marketing – Basics, Present day importance of marketing in national and global context; Market Segmentation Process, Identifying and Evaluation Segments, Market Targeting and Positioning for Competitive Advantage. Consumer Behaviour – Decision Making Perspectives, Improving the judgement process, Models of consumer behaviour; Marketing Information System – Marketing Research System and Marketing Decision Support System.

Research Methods in Marketing – Quantitative and Qualitative Research in Marketing, Attitude Measurement and Scaling Techniques, Product Research, Test Marketing, Advertising Research, Media Research, Motivation Research.

Strategic Marketing – Customer, Competitor and Environmental Analysis; SWOT Analysis, BCG Framework model, Porter’s Model, GE Model, McKinsey Model, Market Leader, Challenger, Follower and Nicher Strategies; Market Entry/Exit Decision; Marketing Mix Strategies; Sustaining Competitive Advantage and Core Competence. New Product Development, Product Mix Strategies, Product Differentiation Strategies, Branding and Packaging Strategies and Decisions.

Logistics and Supply Chain Management; Retail Merchandising – Retailers’ Marketing Mix, Product Merchandising and Display, Vendor Relations, Pricing and Mark Downs, e-retailing, Customer Relationship Management – Customer Life Time Value Customer Acquisition Development and Retention, Brand and Customer Equity.

Nature of Marketing of Services, Services Versus Physical Goods, Different types of service Attributes –Search, Experience and Credence, Marketing Mix, Extended Marketing Mix for Services(Seven Ps of Services), Classification of services, Characteristics of services (4-I’s of Services). Service Consumer and Buying Process, Managing Service Product, Promotion, Place and Service Inventory, Managing Service Product, Promotion, Place and Service Inventory, ‘People’ Element in Marketing Mix and Relationship Marketing.

Reference Books :

1. Kotler, P., Marketing Management; Analysis, Planning, Implementation and Control, New Delhi, MacMillan
2. Schiffman, L.G. and Kanuk, L.L., Consumer Behaviour, New Delhi, PHI.
3. Belch, G.E. & Belch, M.A., Introduction to Advertising and Promotion, Chicago, Irwin.
4. Porter, M.E., Competitive Advantage : Creating, Sustaining Superior Performance, New York, Free Press.
5. Keegan, W., Global Marketing Management, Englewood Cliffs, New Jersey, PHI.
6. Levy, M & Barton, A.W., Retailing Management, Irwin, London.