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 an 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:

4. The complete reference Office Xp- Stephan L. Nelson, Gujulia Kelly (TMH)
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.


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.


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

Reference Books:

- Nancy Lynch, "Distributed Algorithms" 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:

- Timothy Ross, Fuzzy Logic, Wiley India (2007) 2nd ed.
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.


Reference Books:
1. Quality control –by Montgomory
2. Managing for total quality – by N. Logothetis
3. Quality planning and Analysis by Juran and Gryna
5. CAD / CAM by Groover & Zimmers (PHI)
Syllabus for One Semester Ph. D. Course Work
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**

**Statistical Methods**

**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**

**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:
2. M Y Khan, Financial Services, Tata Mc Graw Hill
3. V A Avadhani, Management of financial Services, Himalaya Publication
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:


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.
5. Keegan, W., Global Marketing Management, Englewood Cliffs, New Jersey, PHI.