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MA9110 OPERATIONS RESEARCH

UNIT I QUEUEING MODELS


UNIT II ADVANCED QUEUEING MODELS

Non- Markovian Queues – Pollaczek Khintchine Formula – Queues in Series – Open Queueing Networks – Closed Queueing networks.

UNIT III SIMULATION

Discrete Even Simulation – Monte – Carlo Simulation – Stochastic Simulation – Applications to Queueing systems.

UNIT IV LINEAR PROGRAMMING

Formulation – Graphical solution – Simplex method – Two phase method Transportation and Assignment Problems.

UNIT V NON-LINEAR PROGRAMMING


L + T: 45+15 = 60

TEXT BOOKS


REFERENCES


IT9112 DATA STRUCTURES AND ALGORITHM DESIGN

UNIT I INTRODUCTION
Linear Skip list, Hash table representation Binary Trees, Heaps, Height and weight balanced trees, Tournament Trees.

UNIT II SEARCH TREES

UNIT III GRAPHS
Graphs, Graph Search Methods, Applications of Graphs – Path finding, Spanning Trees, connecting graphs and components.

UNIT IV ALGORITHM ANALYSIS AND DESIGN

UNIT V BACKTRACKING AND BRANCH & BOUND TECHNIQUES
Knapsack - Traveling Salesman Problem - Graph coloring- 8 Queens problem, Sum of Subsets – NP Hard and complete problems.

TOTAL = 45

TEXT BOOKS

REFERENCES


CP9113 ADVANCED COMPUTER ARCHITECTURE

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UNIT I PIPELINING AND ILP 9

UNIT II ADVANCED TECHNIQUES FOR EXPLOITING ILP 9

UNIT III MULTIPROCESSORS 9

UNIT IV MULTI-CORE ARCHITECTURES 9

UNIT V MEMORY HIERARCHY DESIGN 9
Introduction - Optimizations of Cache Performance - Memory Technology and Optimizations - Protection: Virtual Memory and Virtual Machines - Design of Memory Hierarchies - Case Studies.

TOTAL - 45
REFERENCES


MM9112 MULTIMEDIA COMMUNICATION AND NETWORKS

UNIT I IP NETWORKS
Open Data Network Model – Narrow Waist Model of the Internet - Success and Limitations of the Internet – Suggested Improvements for IP and TCP – Significance of UDP in modern Communication – Network level Solutions – End to End Solutions - Best Effort service model – Scheduling and Dropping policies for Best Effort Service model

UNIT II ADVANCED ROUTING

UNIT III GUARANTEED SERVICE MODEL

UNIT IV MULTIMEDIA COMMUNICATION

UNIT V WIRELESS MULTIMEDIA COMMUNICATION
REFERENCES


IT9111  SOFTWARE ENGINEERING METHODOLOGIES

UNIT I       SOFTWARE LIFE CYCLE


UNIT II       TESTING


UNIT III       OBJECT ORIENTATION

Modules – Objects – Reusability – Portability and Interoperability – Planning and Estimation

UNIT IV       ANALYSIS AND DESIGN


UNIT V       IMPLEMENTATION AND INTEGRATION

Implementation Phase – Integration Phase – Maintenance Phase
**TEXT BOOKS**


**REFERENCES**


**DATA STRUCTURES LABORATORY**

1. Min/Max Heaps (Insertion, Deletemin/Delete Max)
2. Binary Search Trees (Insertion, Deletion and Search)
3. AVL Trees (Insertion, Deletion and Search)
4. B-Trees (Insertion, Deletion and Search)
5. Finding Spanning Trees
6. Finding connected components of a graph
7. Knapsack problem
8. Graph coloring
9. Depth-first and Breadth-first searches
IT9121 OBJECT ORIENTED ANALYSIS AND DESIGN

UNIT I

UNIT II

UNIT III

UNIT IV
Patterns – Analysis and Design patterns – GoF Patterns - Mapping designs to code – Test Driven development and refactoring – UML Tools and UML as blueprint

UNIT V
More Patterns – Applying design patterns – Architectural Analysis – Logical Architecture Refinement – Package Design – Persistence framework with patterns

REFERENCES
UNIT I  
Classical Cryptography-The Shift Cipher, The Substitution Cipher, The Affine Cipher  
Cryptanalysis-Cryptanalysis of the Affine Cipher, Cryptanalysis of the Substitution Cipher, Cryptanalysis of the Vigenere Cipher, Shannon’s Theory.

UNIT II  

UNIT III  
The RSA Cryptosystem and Factorin Integer-Introduction to Public –key Cryptography, Number theory, The RSA Cryptosystem, Other Attacks on RSA, The ELGamal Cryptosystem, Shanks’ Algorithm, Finit Fields, Elliptic Curves over the Reals, Elliptical Curves Modulo a Prime, Signature Scheme –Digital Signature Algorithm.

UNIT IV  

UNIT V  

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REFERENCES

CP9121 UNIX INTERNALS L T P C 3 0 0 3

UNIT I OVERVIEW 8

UNIT II FILE SUBSYSTEM 8

UNIT III SYSTEM CALLS FOR THE FILE SYSTEM 10

UNIT IV PROCESSES 10

UNIT V MEMORY MANAGEMENT AND I/O 9

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IT9123 ADVANCES IN DATABASES

UNIT I QUERY AND TRANSACTION PROCESSING

UNIT II PARALLEL AND DISTRIBUTED DATABASES

UNIT III OBJECT AND OBJECT RELATIONAL DATABASES

UNIT IV ENHANCED DATA MODELS

UNIT V EMERGING TECHNOLOGIES

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REFERENCES


SW9121 SOFTWARE QUALITY ASSURANCE

UNIT I  9

UNIT II  9
Basics of software testing – test generation from requirements – finite state models – combinatorial designs - test selection, minimization and prioritization for regression testing – test adequacy, assessment and enhancement

UNIT III  9
Testing strategies – white box and black box approach – integration testing – system and acceptance testing – performance testing – regression testing - internationalization testing – ad-hoc testing – website testing – usability testing – accessibility testing Test plan – management – execution and reporting – software test automation – automated testing tools

UNIT IV  9

UNIT V  9
Project progress control – costs – quality management standards – project process standards – management and its role in SQA – SQA unit

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REFERENCES

### IT9127 UNIX PROGRAMMING LABORATORY

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1. Use of Unix/Linux – User Commands – Editors - Shell programming
2. C/C++ programming on Unix/Linux – use of make, version control
3. Use of system calls – files – processes – I/O – IPC
4. Experiments using C of mini unix systems (such as Minix) – File system – Processes – Memory Management – Drivers
5. Unix / Linux sources – build, run kernel – small modifications
UNIT I CONCEPTS AND ARCHITECTURE  

UNIT II GRID MONITORING  
Grid Monitoring Architecture (GMA) - An Overview of Grid Monitoring Systems- R-GMA - GridICE – MDS- Service Level Agreements (SLAs) - Other Monitoring Systems-Ganglia, GridMon, Hawkeye and Network Weather Service.

UNIT III GRID SECURITY AND RESOURCE MANAGEMENT  

UNIT IV DATA MANAGEMENT AND GRID PORTALS  

UNIT V GRID MIDDLEWARE  
List of globally available Middlewares - Case Studies-Recent version of Globus Toolkit and gLite - Architecture, Components and Features. Features of Next generation grid.

REFERENCES
IT9151 ADVANCED DIGITAL SIGNAL PROCESSING

UNIT I

UNIT II

UNIT III
Structures of IIR – Analog filter design – Discrete time IIR filter from analog filter – IIR filter design by Impulse Invariance, Bilinear transformation, Approximation of derivatives – (HPF, BPF, BRF) filter design using frequency translation

UNIT IV
Structures of FIR – Linear phase FIR filter – Filter design using windowing techniques, Frequency sampling techniques – Finite word length effects in digital Filters

UNIT V

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REFERENCES
UNIT I AD-HOC MAC

UNIT II AD-HOC NETWORK ROUTING & TCP

UNIT III WSN -MAC

UNIT IV WSN ROUTING, LOCALIZATION & QOS

UNIT V MESH NETWORKS

REFERENCES

UNIT I INTRODUCTION TO ERP
UNIT II  ERP IMPLEMENTATION  9
Implementation Life Cycle – Implementation Methodology – Hidden Costs – Organizing
Implementation – Vendors, Consultants and Users – Contracts – Project Management
and Monitoring.

UNIT III  BUSINESS MODULES  9
Plant Maintanance – Materials Management – Quality Management – Sales and
Distribution.

UNIT IV  ERP MARKET  9
ERP Market Place – SAP AG – PeopleSoft – Baan Company – JD Edwards World

UNIT V  ERP – PRESENT AND FUTURE  9
Turbo Charge the ERP System – EIA – ERP and E–Commerce – ERP and Internet –
Future Directions in ERP.

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REFERENCES:

IT9153  SOFTWARE RELIABILITY AND METRICS  L T P C
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UNIT I  INTRODUCTION TO SOFTWARE RELIABILITY  7

UNIT II  SOFTWARE RELIABILITY MODELING  12
Concepts – General Model Characteristic – Historical Development of models – Model Classification scheme – Markovian models – General concepts – General Poisson Type Models – Binomial Type Models – Poisson Type models – Fault reduction factor for Poisson Type models.

UNIT III COMPARISON OF SOFTWARE RELIABILITY MODELS 10

UNIT IV FUNDAMENTALS OF MEASUREMENT 8

UNIT V PRODUCT METRICS 8

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UNIT II APPROXIMATIONS IN SCIENTIFIC COMPUTING 8


UNIT III OPTIMIZATION 8

Optimization Problems - Existence and Uniqueness - Convexity - Optimization in One Dimension - Multidimensional Unconstrained Optimization - Constrained Optimization - Linear Programming

UNIT IV ROOTS OF EQUATION, LINEAR ALGEBRAIC EQUATION AND INTERPOLATION 10


UNIT V NUMERICAL ORDINARY AND PARTIAL DIFFERENTIATION AND INTEGRATION 9


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REFERENCES:

UNIT I INTRODUCTION 8
Components – Types – Ontological Commitments – Ontological Categories –
Philosophical Background -Sample - Knowledge Representation Ontologies – Top Level
Ontologies – Linguistic Ontologies – Domain Ontologies – Semantic Web – Need –
Foundation – Layers – Architecture.

UNIT II LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES 12
Pragmatics - Traditional Ontology Languages – LOOM- OKBC – OCML - Flogic
Ontology Markup Languages – SHOE – OIL - DAML + OIL- OWL

UNIT III ONTOLOGY LEARNING FOR SEMANTIC WEB 12
Taxonomy for Ontology Learning – Layered Approach – Phases of Ontology Learning –
Importing and Processing Ontologies and Documents – Ontology Learning Algorithms -
Evaluation

UNIT IV ONTOLOGY MANAGEMENT AND TOOLS 8
Overview – need for management – development process – target ontology – ontology
mapping – skills management system – ontological class – constraints – issues. volution
– Development of Tools and Tool Suites – Ontology Merge Tools – Ontology based
Annotation Tools.

UNIT V APPLICATIONS 5
Web Services – Semantic Web Services - Case Study for specific domain – Security
issues – current trends.

TOTAL = 45

REFERENCES

1. Asuncion Gomez-Perez, Oscar Corcho, Mariano Fernandez-Lopez “Ontological
Engineering: with examples from the areas of Knowledge Management, e-
Commerce and the Semantic Web” Springer, 2004
2. Grigoris Antoniou, Frank van Harmelen, “A Semantic Web Primer (Cooperative
Information Systems)”, The MIT Press, 2004
edition, 2002
4. John Davies, Dieter Fensel, Frank Van Harmelen, “Towards the Semantic Web:
5. John Davies (Editor), Rudi Studer (Co-Editor), Paul Warren (Co-Editor)
“Semantic Web Technologies: Trends and Research in Ontology-based
Systems”Wiley Publications, Jul 2006
6. Dieter Fensel (Editor), Wolfgang Wahlster, Henry Lieberman, James Hendler,
“Spinning the Semantic Web: Bringing the World Wide Web to Its Full Potential”,
The MIT Press, 2002
8. Steffen Staab (Editor), Rudi Studer, “Handbook on Ontologies (International
Handbooks on Information Systems)”, Springer 1st edition, 2004
UNIT I  INTRODUCTORY CONCEPTS


UNIT II  SEARCH ENGINES AND DATA VISUALIZATION


UNIT III  STATISTICS AND DATA MINING


UNIT IV  PATTERN MATCHING


UNIT V  MODELING AND SIMULATION


REFERENCES


CP9159   SOFT COMPUTING               L T P C
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UNIT I   INTRODUCTION TO SOFT COMPUTING AND NEURAL NETWORKS 9
Evolution of Computing - Soft Computing Constituents – From Conventional AI to Computational Intelligence - Machine Learning Basics

UNIT II   GENETIC ALGORITHMS 9
Introduction to Genetic Algorithms (GA) – Applications of GA in Machine Learning - Machine Learning Approach to Knowledge Acquisition.

UNIT III  NEURAL NETWORKS 9

UNIT IV   FUZZY LOGIC 9

UNIT V   NEURO-FUZZY MODELING 9

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<td>Natural Language Processing – Linguistic Background- Spoken language input and output Technologies – Written language Input - Mathematical Methods - Statistical Modeling and Classification Finite State methods Grammar for Natural Language Processing – Parsing – Semantic and Logic Form – Ambiguity Resolution – Semantic Interpretation.</td>
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<td>Categorization – Extraction based Categorization- Clustering- Hierarchical Clustering-Document Classification and routing- finding and organizing answers from Text search – use of categories and clusters for organising retrieval results – Text Categorization and efficient Summarization using Lexical Chains – Pattern Extraction.</td>
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REFERENCE

CP9163  EMBEDDED SYSTEMS

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<td>Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets</td>
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<td>Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling - Performance issues.</td>
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<td>Meeting real time constraints – Multi-state systems and function sequences. Embedded software development tools – Emulators and debuggers. Design methodologies – Case studies – Complete design of example embedded systems.</td>
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REFERENCES
UNIT I

UNIT II

Association Rule Mining: - Efficient and Scalable Frequent Item set Mining Methods – Mining Various Kinds of Association Rules – Association Mining to Correlation Analysis – Constraint-Based Association Mining.

UNIT III

UNIT IV

UNIT V
Mining Object, Spatial, Multimedia, Text and Web Data:
Multidimensional Analysis and Descriptive Mining of Complex Data Objects – Spatial Data Mining – Multimedia Data Mining – Text Mining – Mining the World Wide Web.

REFERENCES
3. K.P. Soman, Shyam Diwakar and V. Ajay “Insight into Data mining Theory and
SW9155    SUPPLY CHAIN MANAGEMENT

UNIT I    FUNDAMENTALS OF SUPPLY CHAIN MANAGEMENT
Supply chain networks, Integrated supply chain planning, Decision phases in supply chain, process view of a supply chain, supply chain flows, Overview of supply chain models and modeling systems, Supply chain planning: Strategic, operational and tactical, Understanding supply chain through process mapping and process flow chart.

UNIT II    SCM STRATEGIES, PERFORMANCE
Supply chain strategies, achieving strategic fit, value chain, Supply chain drivers and obstacles, Strategic Alliances and Outsourcing, purchasing aspects of supply chain, Supply chain performance measurement: The balanced score card approach, Performance Metrics. Planning demand and supply: Demand forecasting in supply chain, Aggregate planning in supply chain, Predictable variability.

UNIT III    PLANNING AND MANAGING INVENTORIES
Introduction to Supply Chain Inventory Management. Inventory theory models: Economic Order Quantity Models, Reorder Point Models and Multi-echelon Inventory Systems, Relevant deterministic and stochastic inventory models and Vendor managed inventory models.

UNIT IV    DISTRIBUTION MANAGEMENT
Role of transportation in a supply chain - direct shipment, warehousing, cross-docking; push vs. pull systems; transportation decisions (mode selection, fleet size), market channel structure, vehicle routing problem. Facilities decisions in a supply chain. Mathematical foundations of distribution management, Supply chain facility layout and capacity planning.

UNIT V    STRATEGIC COST MANAGEMENT IN SUPPLY CHAIN
The financial impacts, Volume leveraging and cross docking, global logistics and material positioning, global supplier development, target pricing, cost management enablers, Measuring service levels in supply chains, Customer Satisfaction/Value/Profitability/Differential Advantage.

REFERENCES


CP9165 INTEGRATED SOFTWARE PROJECT MANAGEMENT (ELECTIVE I )
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3 0 0 3

UNIT I PROJECT MANAGEMENT CONCEPTS

UNIT II SOFTWARE ESTIMATION & COSTING

UNIT III RISK MANAGEMENT
Risk Definition – Risk Categories – Risk Assessment (Identification / Analysis / Prioritization) – Risk Control (Planning / Resolution / Monitoring) – Failure Mode and Effects Analysis (FMEA)

UNIT IV METRICS

UNIT V PEOPLE MANAGEMENT
Team Management – Client Relationship Management.

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REFERENCES

CP9167 DIGITAL IMAGE PROCESSING

UNIT I FUNDAMENTALS OF IMAGE PROCESSING

UNIT II IMAGE ENHANCEMENT AND RESTORATION

UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS

UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS

UNIT V APPLICATIONS OF IMAGE PROCESSING

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REFERENCES
IT9156  MULTI-CORE PROGRAMMING

**UNIT I  INTRODUCTION TO MULTIPROCESSORS AND SCALABILITY ISSUES**


**UNIT II  PARALLEL PROGRAMMING**


**UNIT III  Openmp Programming**


**UNIT IV  MPI PROGRAMMING**

MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

**UNIT V  MULTITHREADED APPLICATION DEVELOPMENT:**

Algorithms, program development and performance tuning.

**TOTAL : 45 HOURS**

**REFERENCES**

## CP9172 CLOUD COMPUTING

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### REFERENCES

UNIT I  OVERVIEW OF VIRTUALIZATION


UNIT II  SERVER CONSOLIDATION


UNIT III  NETWORK VIRTUALIZATION


UNIT IV  VIRTUALIZING STORAGE


UNIT V  VIRTUAL MACHINES PRODUCTS


TOTAL NUMBER OF PERIODS 45HRS
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UNIT V  
Transaction processing – paradigm – protocols and coordination – transaction specifications – SOA in mobile – research issues

REFERENCES
UNIT I   INTRODUCTION  

UNIT II   QUERYING  
Languages – Key Word based Querying – Pattern Matching – Structural Queries – Query Operations – User Relevance Feedback – Local and Global Analysis – Text and Multimedia languages

UNIT III   TEXT OPERATIONS AND USER INTERFACE  

UNIT IV   MULTIMEDIA INFORMATION RETRIEVAL  

UNIT V   APPLICATIONS  

REFERENCES

UNIT I                                9
Wireless networks- emerging technologies- Blue tooth, WiFi, WiMAX, 3G ,WATM.-
Mobile IP protocols -WAP push architecture-Wml scripts and applications.

UNIT II                    8
Mobile computing environment—functions-architecture-design considerations ,content
architecture -CC/PP exchange protocol ,context manager. Data management in WAE-
Coda file system- caching schemes- Mobility QOS. Security in mobile computing.

UNIT III                   8
Handoff in wireless mobile networks-reference model-handoff schemes. Location
management in cellular networks - Mobility models- location and tracking management
schemes- time, movement ,profile and distance based update strategies. ALI
technologies.

UNIT IV                  10
Pervasive Computing- Principles, Characteristics- interaction transparency, context
aware, automated experience capture. Architecture for pervasive computing- Pervasive
devices-embedded controls.- smart sensors and actuators -Context communication and
access services

UNIT V                 10
Open protocols- Service discovery technologies- SDP, Jini, SLP, UpnP protocols—data
synchronization- SyncML framework - Context aware mobile services -Context aware
sensor networks, addressing and communications. Context aware security.

REFERENCES

1. Ivan Stojmenovic , Handbook of Wireless Networks and Mobile Computing, John
Co. , New Delhi, 2005.
UNIT I  PERSPECTIVES IN HUMAN RESOURCE MANAGEMENT  9

UNIT II  THE CONCEPT OF BEST FIT EMPLOYEE  9

UNIT III  TRAINING AND EXECUTIVE DEVELOPMENT  9
Types of training, methods, purpose, benefits and resistance. Executive development programmes – common practices - benefits – self development – knowledge management.

UNIT IV  SUSTAINING EMPLOYEE INTEREST  9

UNIT V  PERFORMANCE EVALUATION AND CONTROL PROCESS  9

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TEXT BOOKS


REFERENCES

UNIT I

UNIT II

UNIT III
Multicore programming Model – Shared memory model, message passing model, transaction model – OpenMP and MPI Programming.

UNIT IV

UNIT V
Cell Broad band engine architecture, PPE (Power Processor Element), SPE (Synergistic processing element), Cell Software Development Kit, Programming for Multicore architecture.

TOTAL : 45

TEXT BOOK:
3. IBM Journals for Power 5, Power 6 and Cell Broadband engine architecture.

REFERENCES