## SEMESTER I

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**TOTAL CREDIT 12+12+8+11+15+12 = 70**

## LIST OF ELECTIVES

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### MA9219 OPERATIONS RESEARCH

**UNIT I** QUEUEING MODELS  12

**UNIT II** ADVANCED QUEUEING MODELS  12
Non-Markovian Queues – Pollaczek Khintchine Formula – Queues in Series – Open Queueing Networks – Closed Queueing networks.

**UNIT III** SIMULATION  12
Discrete Even Simulation – Monte Carlo Simulation – Stochastic Simulation – Applications to Queueing systems.

**UNIT IV** LINEAR PROGRAMMING  12

**UNIT V** NON-LINEAR PROGRAMMING  12

\[ L + T: 45 + 15 = 60 \text{ PERIODS} \]

**TEXT BOOKS:**


**REFERENCES:**


### CS9212 DATA STRUCTURES AND ALGORITHMS

**UNIT I** COMPLEXITY ANALYSIS & ELEMENTARY DATA STRUCTURES  9

**UNIT II** HEAP STRUCTURES  9
UNIT III  SEARCH STRUCTURES  9

UNIT IV  GREEDY & DIVIDE AND CONQUER  9
Quicksort – Strassen’s matrix multiplication – Convex hull - Tree-vertex splitting – Job sequencing with deadlines – Optimal storage on tapes

UNIT V  DYNAMIC PROGRAMMING AND BACKTRACKING  9
Multistage graphs – 0/1 knapsack using dynamic programming – Flow shop scheduling – 8-queens problem – graph coloring – knapsack using backtracking

TOTAL: 45 PERIODS

REFERENCES:

CS9211  COMPUTER ARCHITECTURE  L  T  P  C
3  0  0  3

UNIT I  FUNDAMENTALS OF COMPUTER DESIGN AND PIPELINING  9

UNIT II  INSTRUCTION LEVEL PARALLELISM WITH DYNAMIC APPROACHES  9

UNIT III  INSTRUCTION LEVEL PARALLELISM WITH SOFTWARE APPROACHES  9
Compiler techniques for exposing ILP – Static branch prediction – VLIW – Advanced compiler support – Hardware support for exposing more parallelism – Hardware versus software speculation mechanisms – Case studies.

UNIT IV  MULTIPROCESSORS AND MULTICORE ARCHITECTURES  9
UNIT V  MEMORY AND I/O 9
Cache performance – Reducing cache miss penalty and miss rate – Reducing hit time –
Main memory and performance – Memory technology. Types of storage devices –
Buses – RAID – Reliability, availability and dependability – I/O performance measures –
Designing an I/O system.

REFERENCES:

TOTAL: 45 PERIODS

CS9215  DATA STRUCTURES LABORATORY  L  T  P  C
0  0  3  2

1. Min Heap
2. Deaps
3. Leftist Heap
4. AVL Tree
5. B-Tree
6. Tries
7. Quick Sort
8. Convex hull
9. 0/1 Knapsack using Dynamic Programming
10. Graph coloring using backtracking

TOTAL: 45 PERIODS

IT9221  INFORMATION SYSTEMS DESIGN  L  T  P  C
3  0  0  3

UNIT I  INFORMATION SYSTEM AND ORGANIZATION  9

UNIT II    REPRESENTATION AND ANALYSIS OF SYSTEM STRUCTURE    9

UNIT III    SYSTEMS, INFORMATION AND DECISION THEORY    9

UNIT IV    INFORMATION SYSTEM APPLICATION    9

UNIT V    DEVELOPMENT AND MAINTENANCE OF INFORMATION SYSTEMS    9

TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:


IT9222    SOFTWARE REQUIREMENTS ENGINEERING    3 0 0 3

UNIT I    REQUIREMENTS ENGINEERING OVERVIEW    9
UNIT II REQUIREMENTS ELICITATION

UNIT III REQUIREMENTS ANALYSIS

UNIT IV REQUIREMENTS DEVELOPMENT

UNIT V REQUIREMENTS VALIDATION

TOTAL = 45 PERIODS

TEXT BOOKS:

UNIT II OBJECT ORIENTED DATABASES 10

UNIT III EMERGING SYSTEMS 10
Enhanced Data Models - Client/Server Model - Data Warehousing and Data Mining - Web Databases – Mobile Databases.

UNIT IV DATABASE DESIGN ISSUES 10

UNIT V CURRENT ISSUES 10
Rules - Knowledge Bases - Active and Deductive Databases - Parallel databases – Multimedia Databases – Image Databases – Text Database

TOTAL : 45 PERIODS

REFERENCES:

IT9225 INTERNET PROGRAMMING LAB 1 T P C

1. Designing Web Pages using Client Side Scripting and DHTML.
2. Client Server Scripting Programs.
5. XML and Databases.
6. Server Side Application Using JSP.

TOTAL : 60 PERIODS

CS9213 COMPUTER NETWORKS AND MANAGEMENT L T P C
3 0 0 3

UNIT I HIGH SPEED NETWORKS 9

UNIT II CONGESTION AND TRAFFIC MANAGEMENT 9

UNIT III TCP AND ATM CONGESTION CONTROL 10

UNIT IV INTEGRATED AND DIFFERENTIATED SERVICES 9

UNIT V PROTOCOLS FOR QoS SUPPORT 8

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
IT9211 SOFTWARE ENGINEERING

UNIT I
Definition – systems approach – modeling the process and lifecycle – meaning of process – software process models – tools and techniques – practical process modeling – information systems – planning and managing the project – tracking project – project personnel – effort estimation – risk management – project plan – process models and project management

UNIT II

UNIT III

UNIT IV

UNIT V

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:


CS9216 NETWORKING LABORATORY L T P C
0 0 3 2

1. Socket Programming
   a. TCP Sockets
   b. UDP Sockets
   c. Applications using Sockets
2. Simulation of Sliding Window Protocol
3. Simulation of Routing Protocols
4. Development of applications such as DNS/ HTTP/ E – mail/ Multi - user Chat
5. Simulation of Network Management Protocols
6. Study of Network Simulator Packages – such as opnet, ns2, etc.

TOTAL: 45 PERIODS

CS9224 INFORMATION SECURITY L T P C
3 0 0 3

UNIT I
An Overview of Computer Security, Access Control Matrix, Policy-Security policies, Confidentiality policies, Integrity policies and Hybrid policies.

UNIT II
Cryptography- Key management – Session and Interchange keys, Key exchange and generation, Cryptographic Key Infrastructure, Storing and Revoking Keys, Digital Signatures, Cipher Techniques

UNIT III

UNIT IV
Malicious Logic, Vulnerability Analysis, Auditing and Intrusion Detection

UNIT V
TEXT BOOK:

REFERENCES:

IT9224  DISTRIBUTED SYSTEMS   L  T  P  C  3 0 0 3

UNIT I  INTRODUCTION AND COMMUNICATION  8

UNIT II  DISTRIBUTED OPERATING SYSTEMS  12

UNIT III  DISTRIBUTED SHARED MEMORY AND FAULT TOLERANCE  9

UNIT IV  DISTRIBUTED FILE SYSTEMS  8

UNIT V  CASE STUDIES  8
CORBA – Mach – JINI.

TOTAL :45 PERIODS

TEXT BOOKS:

REFERENCES:

SE9217 CASE TOOLS LABORATORY

1. Practicing the different types of case tools such as (Rational Rose & other Open Source) used for all the phases of Software development life cycle.
2. Data modeling
3. Semantic data modeling
4. Source code generators
5. Re-engineering
6. Experimenting CASE Environments
   a. Toolkits
   b. Language-centered
   c. Integrated
   d. Fourth generation
   e. Process-centered
7. Implementation of the following using CASE Workbenches:
   a. Business planning and modeling
   b. Analysis and design
   c. User-interface development
   d. Programming
   e. Verification and validation
   f. Maintenance and reverse engineering
   g. Configuration management
   h. Project management

TOTAL :45 PERIODS
UNIT I MEASUREMENTS THEORY

UNIT II DATA COLLECTION AND ANALYSIS

UNIT III PRODUCTS METRICS

UNIT IV QUALITY METRICS

UNIT V MANAGEMENT METRICS

TOTAL : 45 PERIODS

REFERENCES:

CS9258 BIO INFORMATICS

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

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:

IT9251 DIGITAL SIGNAL PROCESSING

L T P C
3 0 0 3

AIM:
To give an understanding on the study that deals with the representation of signals as ordered sequences of numbers and how to process those ordered sequences.

OBJECTIVES:
• To understand the basics of signals and system by analyzing the various transformations available and determine their use to DSP
• To study on the various digital filtering techniques and how to apply to DSP
• To study on the ways to estimate signal parameters, and transform a signal into a form that is more informative.
• To give students a flavour on the applications of DSP in the areas of speech and image
UNIT I SIGNALS AND SYSTEMS

UNIT II FREQUENCY TRANSFORMATIONS

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

UNIT V APPLICATIONS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

CS 9257 XML AND WEB SERVICES

UNIT I XML TECHNOLOGY FAMILY

UNIT II ARCHITECTING WEB SERVICES
UNIT III  WEB SERVICES BUILDING BLOCK  9
Transport protocols for web services – messaging with web services – protocols – SOAP –
describing web services – WSDL – Anatomy of WSDL – manipulating WSDL – web
service policy – Discovering web services – UDDI – Anatomy of UDDI- Web service
inspection – Ad-Hoc Discovery – Securing web services.

UNIT IV  IMPLEMENTING XML IN E-BUSINESS  9
B2B - B2C Applications – Different types of B2B interaction – Components of e-
services for mobile devices.

UNIT V  XML AND CONTENT MANAGEMENT  9
Semantic Web – Role of Meta data in web content – Resource Description Framework
– RDF schema – Architecture of semantic web – content management workflow –
XLANG –WSFL.

TOTAL: 45 PERIODS

TEXT BOOK
2. Sandeep Chatterjee and James Webber, “Developing Enterprise Web Services: An

REFERENCES
1. Frank P. Coyle, “XML, Web Services and the Data Revolution”, Pearson Education,
   2002.
2. Keith Ballinger, “.NET Web Services Architecture and Implementation”, Pearson
3. Henry Bequet and Meeraj Kunnumpurath, “Beginning Java Web Services”, Apress,
   2004.
4. Russ Basiura and Mike Batongbacal, “Professional ASP.NET Web Services”,

IT9252  ENTERPRISE RESOURCE PLANNING  L T P C
3 0 0 3

UNIT I  INTRODUCTION TO ERP  9
Overview – Benefits of ERP – ERP and Related Technologies – Business Process
Reengineering – Data Warehousing – Data Mining – On–line Analytical Processing –
Supply Chain Management.

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

UNIT IV   ERP MARKET

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

REFERENCES:

CS9252   GRID COMPUTING
L T P C
3 0 0 3

UNIT I  INTRODUCTION TO GRID COMPUTING

UNIT II  GRID COMPUTING ARCHITURE
Grid Computing anatomy – Next generation of Grid computing initiatives–Merging the Grid services architecture with Web services architecture.

UNIT III  GRID COMPUTING TECHNOLOGIES
OGSA – Sample use cases that drive the OGSA platform components – OGSI and WSRF – OGSA Basic Services – Security standards for grid computing.

UNIT IV  GRID COMPUTING TOOL KIT

UNIT V  HIGH LEVEL GRID SERVICES
High level grid services – OGSI .NET middleware Solution Mobile OGSI.NET for Grid computing on Mobile devices.

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I  INTRODUCTION TO SYSTEM MODELING  10
Modeling and General Systems Theory-Concepts of Simulation-Types of Simulation-
Experimental Design Consideration- Comparison and Selection of Simulation
Languages-Development of Simulation Models Using any one of the Languages for
Some Problems -Stochastic Simulation - Randomness and Random Numbers -
Random Number Generators - Software for Generating Random Numbers.

UNIT II  APPROXIMATIONS IN SCIENTIFIC COMPUTING  8
General Strategy - Approximations in Scientific Computation - Mathematical Software -
Mathematical Software Libraries - Scientific Computing Environments - Extended
Arithmetic Packages

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
Graphical Method – Iterative Methods- Newton-Raphson Method- Break-Even Analysis-
Gauss Elimination-Solution Of Linear Systems By Gaussian, Gauss-Jordan, Jacobi And
Gauss Seidel Methods-Matrix Inversion-Gauss-Jordan Method. Least-Square
Regression -Newton’s Divided-Difference Interpolating Polynomials-Lagrange’s
polynomials-Newton’s Forward and Backward Difference Formula- Stirling’s and
Bessel’s Central Difference Formula.

UNIT V  NUMERICAL ORDINARY AND PARTIAL DIFFERENTIATION AND
INTEGRATION  9
Numerical Differentiation: Runge-Kutta Methods, Boundary-Value and Eigen value
Integration: Trapezoidal and Simpson’s Rules – Two and Three Point Gaussian
Quadrature Formula – Double Integral Using Trapezoidal and Simpson’s Rule.

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:
   India, 1998
UNIT I  HIGH SPEED NETWORKS  9

UNIT II  CONGESTION AND TRAFFIC MANAGEMENT  9

UNIT III  TCP AND ATM CONGESTION CONTROL  10

UNIT IV  INTEGRATED AND DIFFERENTIATED SERVICES  9

UNIT V  PROTOCOLS FOR QoS SUPPORT  8

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I 9
Pervasive Computing Application - Pervasive Computing devices and Interfaces - Device technology trends, Connecting issues and protocols.

UNIT II 9

UNIT III 9
Voice Enabling Pervasive Computing - Voice Standards - Speech Applications in Pervasive Computing and security.

UNIT IV 9

UNIT V 9

TOTAL : 45 PERIODS

TEXT BOOKS:


REFERENCES:

UNIT I INTRODUCTION 9

UNIT II JAVA COMPONENT TECHNOLOGIES 9

UNIT III CORBA TECHNOLOGIES 9

UNIT IV COM AND .NET TECHNOLOGIES 9

UNIT V COMPONENT FRAMEWORKS AND DEVELOPMENT 9

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
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

TOTAL : 45 PERIODS

TEXT BOOKS:

REFERENCES:
UNIT I  INTRODUCTION  

UNIT II  INFORMATION RETRIEVAL  

UNIT III  TEXT MINING  
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.

UNIT IV  GENERIC ISSUES  

UNIT V  APPLICATIONS  

TOTAL : 45 PERIODS

TEXT BOOKS:

UNIT I  INTRODUCTION  8

UNIT II  SEARCHING TECHNIQUES  10

UNIT III  KNOWLEDGE REPRESENTATION  10

UNIT IV  LEARNING  9

UNIT V  APPLICATIONS  8

TOTAL :45 PERIODS

REFERENCES
UNIT I  EMBEDDED COMPUTING  9
Challenges of Embedded Systems – Embedded system design process. Embedded processors – ARM processor – Architecture, ARM and Thumb Instruction sets

UNIT II  EMBEDDED C PROGRAMMING  9

UNIT III  OPTIMIZING ASSEMBLY CODE  9

UNIT IV  PROCESSES AND OPERATING SYSTEMS  9
Multiple tasks and processes – Context switching – Scheduling policies – Interprocess communication mechanisms – Exception and interrupt handling - Performance issues.

UNIT V  EMBEDDED SYSTEM DEVELOPMENT  9
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.

TOTAL : 45 PERIODS

REFERENCES

CS9264  DATA WAREHOUSING AND DATA MINING  L T P C
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UNIT I  9

UNIT II  9
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

REFERENCES

CS9251 MOBILE COMPUTING L T P C
3 0 0 3

UNIT I WIRELESS COMMUNICATION FUNDAMENTALS

UNIT II TELECOMMUNICATION SYSTEMS

UNIT III WIRELESS NETWORKS
UNIT IV NETWORK LAYER

UNIT V TRANSPORT AND APPLICATION LAYERS

TOTAL: 45 PERIODS

TEXT BOOKS:

REFERENCES:

IT9257 SUPPLY CHAIN MANAGEMENT

UNIT I BUILDING BLOCKS, PERFORMANCE MEASURES, DECISIONS

UNIT II SUPPLY CHAIN INVENTORY MANAGEMENT
Economic Order Quantity Models – Reorder Point Models – Multichelon Inventory Systems.

UNIT III MATHEMATICAL FOUNDATIONS OF SUPPLY CHAIN SOLUTIONS

UNIT IV INTERNET TECHNOLOGIES AND ELECTRONIC COMMERCE IN SCM

UNIT V CASE STUDIES
Digital Equipment Case Study – IBM Case Study.
CS9269 SOFTWARE PROJECT MANAGEMENT

UNIT I  BASIC CONCEPTS

UNIT II  FORMAT PROCESS MODELS AND THEIR USE
Definition and Format model for a process – The ISO 9001 and CMM Models and their relevance to Project Management – Other Emerging Models like People CMM.

UNIT III  UMBRELLA ACTIVITIES IN PROJECTS

UNIT IV  IN STREAM ACTIVITIES IN PROJECTS
Project Initiation – Project Planning – Execution and Tracking – Project Wind up – Concept of Process/Project Database.

UNIT V  ENGINEERING AND PEOPLE ISSUES IN PROJECT MANAGEMENT

TOTAL : 45 PERIODS

REFERENCES:
REFERENCES:
4. Bob Hughes and Mike Cotterell, "Software Project Management".

CS9261 DIGITAL IMAGING L T P C
3 0 0 3

UNIT I FUNDAMENTALS OF IMAGE PROCESSING 9

UNIT II IMAGE ENHANCEMENT 9

UNIT III IMAGE SEGMENTATION AND FEATURE ANALYSIS 9

UNIT IV MULTI RESOLUTION ANALYSIS AND COMPRESSIONS 9

UNIT V APPLICATIONS OF IMAGE PROCESSING 9

TOTAL : 45 PERIODS

REFERENCES: