# UNIVERSITY DEPARTMENTS

ANNA UNIVERSITY CHENNAI  :  CHENNAI 600 025

REGULATIONS - 2009

CURRICULUM I TO VI SEMESTERS (PART TIME)

M.TECH. INFORMATION TECHNOLOGY

## SEMESTER I

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## SEMESTER II

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**List of Electives**

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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

1. Fundamentals


2. Data Structures


3. Algorithm Design: I


4. Algorithm Design: II


5. Approximation Algorithms

   Planar Graph Coloring – Maximum Program Stored Problem – Bin Packing – Scheduling Independent Tasks – 0/1 Knapsack – Rounding – Interval
Partitioning.

References:


CP9113 ADVANCED COMPUTER ARCHITECTURE

UNIT I PIPELINING AND ILP

UNIT II ADVANCED TECHNIQUES FOR EXPLOITING ILP

UNIT III MULTIPROCESSORS

UNIT IV MULTI-CORE ARCHITECTURES

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

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

TOTAL = 45

TEXT BOOKS


REFERENCES


IT9115 DATA STRUCTURES LABORATORY

L T P C 0 0 3 2

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
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
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 Factoring Integer-Introduction to Public-key Cryptography, Number Theory, The RSA Cryptosystem, Other Attacks on RSA, The ElGamal Cryptosystem, Shanks’ Algorithm, Finite Fields, Elliptic Curves over the Reals, Elliptical Curves Modulo a Prime, Signature Scheme-Digital Signature Algorithm.

UNIT IV

UNIT V

TOTAL: 45

TEXT BOOK

REFERENCES

CP9121  UNIX INTERNALS

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

TOTAL = 45

TEXT BOOKS

REFERENCES

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

REFERENCES


SW9121 SOFTWARE QUALITY ASSURANCE

L T P C
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UNIT I

UNIT II
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
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

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

TOTAL = 45

REFERENCES
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.

TOTAL : 45

REFERENCES
5. Srikumar Venugopal, Krishna Nadiminti, Hussein Gibbins and Rajkumar Buyya,

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


TOTAL = 45

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


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:

UNIT I INTRODUCTION TO SOFTWARE RELIABILITY

UNIT II SOFTWARE RELIABILITY MODELING
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

UNIT IV FUNDAMENTALS OF MEASUREMENT

UNIT V PRODUCT METRICS

REFERENCES
UNIT I

INTRODUCTION TO SYSTEM MODELING


UNIT II

APPROXIMATIONS IN SCIENTIFIC COMPUTING


UNIT III

OPTIMIZATION


UNIT IV

ROOTS OF EQUATION, LINEAR ALGEBRAIC EQUATION AND INTERPOLATION


UNIT V

NUMERICAL ORDINARY AND PARTIAL DIFFERENTIATION AND INTEGRATION

TEXT BOOKS:

REFERENCES:

IT9155  
ONTOLOGY AND SEMANTIC WEB

UNIT I  
INTRODUCTION

UNIT II  
LANGUAGES FOR SEMANTIC WEB AND ONTOLOGIES

UNIT III  
ONTOLOGY LEARNING FOR SEMANTIC WEB

UNIT IV  
ONTOLOGY MANAGEMENT AND TOOLS

UNIT V  
APPLICATIONS

REFERENCES

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  9

REFERENCES

CP9159  SOFT COMPUTING  L T P C  3 0 0 3

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
TEXT BOOKS

REFERENCES

IT9160 NATURAL LANGUAGE PROCESSING

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

TEXT BOOKS

REFERENCES

CP9163 EMBEDDED SYSTEMS

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

UNIT II EMBEDDED C PROGRAMMING

UNIT III OPTIMIZING ASSEMBLY CODE

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

REFERENCES


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

1. Jiawei Han and Micheline Kamber “Data Mining Concepts and Techniques” Second Edition,

SW9155 SUPPLY CHAIN MANAGEMENT

UNIT I FUNDAMENTALS OF SUPPLY CHAIN MANAGEMENT
Supply chain networks, Integrated supply chain planning, Decision phases in s 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 Multiechelon 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

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.

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

TOTAL = 45

REFERENCES

UNIT III  Openmp Programming  9

UNIT IV  MPI PROGRAMMING  9
MPI Model – collective communication – data decomposition – communicators and topologies – point-to-point communication – MPI Library.

UNIT V  MULTITHREADED APPLICATION DEVELOPMENT:  9
Algorithms, program development and performance tuning.

TOTAL : 45 HOURS

REFERENCES


UNIT III CLOUD COMPUTING FOR EVERYONE 10
Centralizing Email Communications – Collaborating on Schedules – Collaborating on To-Do Lists – Collaborating Contact Lists – Cloud Computing for the Community – Collaborating on Group Projects and Events – Cloud Computing for the Corporation

UNIT IV USING CLOUD SERVICES 10

UNIT V OTHER WAYS TO COLLABORATE ONLINE 9

TOTAL=45

REFERENCES


CP9169 VIRTUALIZATION TECHNIQUES

UNIT I OVERVIEW OF VIRTUALIZATION 10
UNIT II  SERVER CONSOLIDATION  8


UNIT III  NETWORK VIRTUALIZATION  10


UNIT IV  VIRTUALIZING STORAGE  8


UNIT V  VIRTUAL MACHINES PRODUCTS  9


TOTAL NUMBER OF PERIODS 45HRS

REFERENCES


CP9170  SERVICE ORIENTED ARCHITECTURE  L T P C

UNIT I  9

Architecture for enterprise application – Software platforms for enterprise Applications – Patterns for SOA – SOA programming models

UNIT II

UNIT III

UNIT IV

UNIT V
Transaction processing – paradigm – protocols and coordination – transaction specifications – SOA in mobile – research issues

REFERENCES

IT9158 INFORMATION RETRIEVAL TECHNIQUES

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  9
Document Preprocessing – Clustering – Text Compression - Indexing and Searching – Inverted
files – Boolean Queries – Sequential searching – Pattern matching – User Interface and

UNIT IV  MULTIMEDIA INFORMATION RETRIEVAL  9
Data Models – Query Languages – Spatial Access Models – Generic Approach – One
Dimensional Time Series – Two Dimensional Color Images – Feature Extraction

UNIT V  APPLICATIONS  9
Searching the Web – Challenges – Characterizing the Web – Search Engines – Browsing –
Architectural Issues – Document Models, Representations and Access – Prototypes and
Standards

REFERENCES

1. Ricardo Baeza-Yate, Berthier Ribeiro-Neto, “Modern Information Retrieval”, Pearson
   Education Asia, 2005.
2. G.G. Chowdhury, “Introduction to Modern Information Retrieval”, Neal-
3. Daniel Jurafsky and James H. Martin, “Speech and Language
   Processing”, Pearson Education, 2000
4. David A. Grossman, Ophir Frie
   Academic Press, 2000
5. Charles T. Meadow, Bert R. Boyce, Donald H. Kraft, “Text Information

TOTAL = 45

CP9125  MOBILE AND PERVERSIVE COMPUTING  L T P C
                                            3 0 0 3

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

UNIT II
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

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

TOTAL ; 45

REFERENCES
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

TOTAL = 45

TEXT BOOKS

REFERENCES

CP9177  MULTICORE ARCHITECTURE  

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