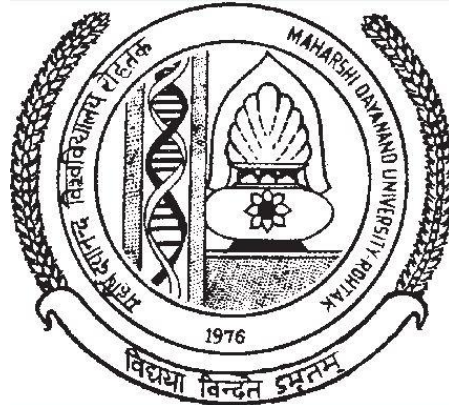


Maharshi Dayanand University, Rohtak



Syllabus and Courses of Reading for M. Tech. (INFORMATION TECHNOLOGY) Examination

Session 2014-15

I Semester
MTCE-601A
COMPUTER SYSTEM SOFTWARE

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **Introduction:** Introduction to Object Oriented Programming and Object Oriented Design.
2. **Concepts of classes:** Classes, objects, abstraction, encapsulation, inheritance, function overloading, virtual functions, function overriding, templates.
3. **Object modeling :** Class and object diagrams, association, aggregation, generalization, dynamic modeling and functional modeling.
4. **Introduction to UML :** Class diagrams, Use cases, interaction diagrams, collaboration diagrams, deployment diagrams.
5. **Principles of class design :** Open close principle, Liskov's substitution principle, dependency inversion principle, package cohesion principle etc.
6. **System Software design issue:** Design of assemblers, macro processors, linkers and loaders, dynamic linking.

Text Books:

1. Object Oriented Programming with C++ By Robert Lafore
2. Object Oriented Modeling and Design By James Rumbaugh

Reference Books:

1. System Programming By Dhamdhare
2. System Programming By Donovan
3. Object Oriented Analysis & Design By Grady Booch

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTIT- 603A
DATA STRUCTURES AND ALGORITHM DESIGN

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction:** Overview of C++ classes, pointers, parameters passing, templates.
- 2. Fundamentals of algorithm analysis:** Big ‘O’ notations, Time and space complexity of algorithms, Elementary data structures and their applications.
- 3. Arrays:** ordered lists, representation of arrays, sparse matrices, linked lists: singly and doubly linked lists, stacks, queues, multiples stacks and queues, Applications: polynomial arithmetic, infix, postfix and prefix arithmetic expression conversion and evaluations.
- 4. Lists, Stacks & Queues:** Abstract Data Types, Representation & implementation of linked list, Doubly linked list, Circular linked lists, Stacks, array representation of stack. Applications of stacks. Queues, array representation of Queues, Circular queues, Deques, priority queues, Applications of Queues.
- 5. Trees:** Introduction to trees, binary trees, representation and traversal of trees, operations on binary trees, types of binary trees, threaded binary trees, B Trees, AVL Trees, Application of trees.
- 6. Graphs:** Representation, traversal, connected components, shortest path and transitive closure, topological sort, activity network, critical path, path enumeration. Dijkstra’s Algorithm, Floyd Warshall’s Algorithm, Minimum Spanning Tree Definitions.
- 7. Searching & Sorting:** searching techniques, Hash function, Hash table, Internal sort: Radixsort, Insertion sort, Exchange sort, Selection sort, Quicksort, Mergesort, Heaport, External sort: K-way mergesort, balanced mergesort.
- 8. Files:** Files, Queries and sequential organization; Cylinder surface indexing, Hashed Indexed, Tree Indexing, Sequential file organization, random file organization, Hashed file organization, Inverted files, cellular partitions.

Text Books:

1. E. Horowitz and S. Sahani, “Fundamentals of Data Structures”, Galgotia Booksource.
2. Data Structures & Algorithm Analysis in C++, Mark Allen Weiss. Second edition, Pearson Edition. Asia.
3. Data Structures using C by A.M.Tenenbaum, Langsam, Moshe J. Augentem, PHI pub.

References Books:

1. Y. Langsam et. al., "Data Structures using C and C++", PHI.
2. Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline, TMH

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 703A
ADVANCE DATABASE MANAGEMENT SYSTEM

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction :** Architecture. Advantages, Disadvantages, Data models, relational algebra, SQL, Normal forms.
- 2. Query Processing :** General strategies for query processing, transformations, expected size, statistics in estimation, query improvement, query evaluation, view processing, query processor.
- 3. Recovery :** Reliability, transactions, recovery in centralized DBMS, reflecting updates, Buffer management, logging schemes, disaster recovery.
- 4. Concurrency :** Introduction, serializability, concurrency control, locking schemes, timestamp based ordering, optimistic scheduling, multiversion techniques, deadlocks.
- 5. Object Oriented Data base Development :** Introduction, Object definition language, creating object instances, Object query language.
- 6. Distributed Databases :** Basic concepts, options for distributing a database, distributed DBMS.
- 7. Data warehousing :** Introduction, basic concepts, data warehouse architecture, data characteristics, reconciled data layer, data transformation, derived data layer, user interface.
- 8. Object Relational Databases :** Basic concepts, enhanced SQL, advantages of object relational approach.

Text Books :

1. An Introduction to database systems by Bipin C. Desai, Galgotia Publications.
2. Modern Database Management by Feffray A. Lioffer, Mary B. Prescottl, Fred R Mcfadden, Pearson Education.
3. Principles of distributed database systems, by M.Tamer & Valduriez, Pearson education.
4. Database system concepts by Korth, TMH.

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

ELECTIVE-I

**MTIT- 607A
SOFTWARE ENGINEERING**

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction:** Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models, Overview of Quality Standards like ISO 9001, SEI – CMM.
- 2. Software Requirements analysis & specifications:** Requirement engineering, requirement elicitation techniques like FAST, QFD & Use case approach, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics & organization of SRS.
- 3. Software Project Planning:** Size Estimation like lines of Code & Function Count, Cost Estimation Models, Static single & Multivariable Models, COCOMO, COCOMO-II, Putnam resource allocation model, Risk Management.
- 4. Software Design:** Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, User Interface Design.
- 5. Software Metrics:** Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics, Information Flow Metrics
- 6. Software Testing:** Testing process, Design of test cases, functional testing: Boundary value analysis, Equivalence class testing, Decision table testing, Cause effect graphing, Structural testing, Path Testing, Data flow and mutation testing, Unit Testing, Integration and System Testing, Debugging, Alpha & Beta Testing, Regression Testing, Testing Tools & Standards.
- 7. Software Reliability:** Importance, Hardware Reliability & Software Reliability, Failure and Faults, Reliability Models, Basic Model, Logarithmic Poisson Model, Calendar time Component.
- 8. Software Maintenance:** Management of Maintenance, Maintenance Process, Maintenance Models, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

Text Books:

1. K. K. Aggarwal & Yogesh Singh, “Software Engineering”, New Age International.
2. R. S. Pressman, “Software Engineering – A practitioner’s approach”, McGraw Hill Int. Ed.,

Reference Books:

1. R. Fairley, "Software Engineering Concepts", Tata McGraw Hill.
2. P. Jalote, "An Integrated approach to Software Engineering", Narosa.
3. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN.
4. James Peter, W. Pedrycz, "Software Engineering", John Wiley & Sons.
5. I. Sommerville, "Software Engineering", Addison. Wesley

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 607A
INTERNET & WEB TECHNOLOGY

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **Introduction:** Internet Protocol model, Internet Addresses, IP routing concepts, Table Driven and next hop routing, other routing related protocols, Internet Access through PPP, SLIP, WWW, Web servers, Browsers.
2. **Router Technology:** Hubs, Bridges, Routers, Routing Protocols, Routing Security, switch based routing, routing in unicast environment, multicasting, mobile routing.
3. **Web Server Technology:** Web's Robot global access to information, HTML, HTTP, Accessing a web server, publishing on web server, secure HTTP, Secure Sockets Layer, WWW Proxies, IIS, Case study of apache web server.
4. **Browsing Systems:** Searching and web casting Technique, popular web servers, basic features bookmarks, cookies, progress indicators, customization of browsers, browsing tricks, next generation web browsing, search engines, architecture of search engines, search tools, web crawlers, types of crawlers, scalable web crawler, incremental crawler, parallel crawler, focused crawler, agent based crawler, case study of IE.
5. **Web site Development:** HTML, XHTML, DHTML, XML, Structuring data, namespaces, XML schema Documents, Document Object Model, DOM methods, Simple API for XML, XSL, SOAP, ASP. Net. Security and management issues for creating a web site.

Text Books :

1. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp, TMH.
2. Internet & World Wide Programming, Deitel, Deitel & Nieto, Pearson Education.
3. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Ragett, Jenny Raggett, Subastian Schnitenbaumer & ted Wugofski, WROX press (Indian shroff Publ. SPD).
4. Complete reference guide to java script, Aron Weiss, QUIE
5. Intranet & Internet Engg. By Minoli
6. Internet & Web Technology By Rajkamal.

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 609A

OOPS LAB

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 4 |

Practical based on theory paper Computer System Software

MTIT- 611A

DATA STRUCTURES LAB

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 4 |

Practical based on theory paper Data Structure & Algorithm Design

MTIT- 613A

SEMINAR

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 2 |

On the latest topic

II Semester
MTIT- 602A

DISTRIBUTED OPERATING SYSTEM

| | | | | | |
|---------------------|----------|------------|--------------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| | | 150 | | | |
| Total | : | | | | |
| Time | : | | 3 hrs | | |

1. **Distributed computing systems fundamentals:** Introduction to Distributed computing systems, Models, Popularity. Distributed computing system, Design issues of Distributed operating system. Distributed computing environment, security.
2. **Message Passing:** Features of a good Message Passing System. Issues in IPC by Message Passing Synchronization, Bullring, Multidatagram Messages, Encoding and Decoding of Message Data, Process Addressing, Failure handling, Group Communication.
3. **Remote Procedure Calls:** RPC Model, Implementing RPC Mechanism. Stub Generation. RPC Messages, Marshaling Arguments and Results. Server Management, Parameter, Passing semantics, call semantics, Communication protocols for RPCs, Client, Server Building, Exception handling, Security RPC in Heterogeneous Environments, Lightweight RPC.
4. **Distributed Shared Memory:** General Architecture of DSM systems. Design and implementation Issues of DSM, Granularity, Structure of Shared Memory Space. Consistency models, Replacement strategy, Thrashing, Synchronization: Clock Synchronization. Event Ordering, Mutual Exclusion, Deadlock, Election Algorithms.
5. **Resource Management:** Features of global scheduling algorithm. Task assignment approach, Load, Balancing and Load approach.
6. **Process Management:** Introduction, Process Migration, Threads.
7. **Distributed File Systems:** Features of good DFS, File models, File Accessing models. File Sharing Semantics, File, Caching schemes, File Replication, Fault Tolerance, Automatic Transactions, Design Principles, Case study: DCE Distributed File Service.

Text Books:

1. Distributed Operating Systems concepts and design, .K. Sinha (PHI).
2. Modern Operating System, Singhal

Reference Books:

1. Distributed Systems concepts and design, G.Coulouris, J.Dollimore & T. Kindberg
2. Modern Operating System, A.S. Tanenbaum(PHI).

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 602 A

SOFT COMPUTING

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **Neural Networks:** History, overview of biological Neuro-system, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning ANN training algorithms-perceptrons, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Hopfield Networks, Associative Memories, Applications of Artificial Neural Networks.
2. **Fuzzy Logic :** Introduction to fuzzy Logic, Classical and Fuzzy Sets, Overview of Classical Sets, Membership Function, Fuzzy rule generation.
3. **Operations on Fuzzy Sets:** Compliment, Intersection, Union, Combination of Operations, Aggregation Operation.
4. **Fuzzy Arithmetic:** Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations.
Classical Logic, Multi-valued Logics, Fuzzy Propositions, Fuzzy Qualifiers, Linguistic Hedges.
5. **Uncertainty based information:** Information & Uncertainty, Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

Text Books:

1. Neural Networks by Simon Haykin
2. Neural Networks by Kosko
3. Fuzzy Logic & Fuzzy Sets by Klir & Yuan
4. Neutral networks by Satish Kumar

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 606A
MOBILE AND WIRELESS COMMUNICATION

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction:** Application, history, market, reference model and overview. Wireless Transmission-Frequencies, signals, antennae, signal propagation, multiplexing, modulation, spread spectrum, cellular system.
- 2. MAC and Telecommunication System:** Specialized MAC, SDMA, FDMA, TDMA-fixed TDM, classical ALOHA, Slotted, ALOHA, CSMA, DAMA, PKMA, reservation TDMA. Collision avoidance, polling inhibit sense multiple access. CDMA, comparison, CSM-mobile services, architecture radio interface, protocol, localization, calling handover, security, new data services, Introduction to W'LL.
- 3. Satellite and Broadcast Systems:** History, Applications, GEO, LEO, MEO, routing, localization, handover in satellite system. Digital audio and video broadcasting.
- 4. Wireless LAN :** IEEE 802 11-System and protocol architecture, physical layer. MAC layered management. Bluetooth-User scenarios, physical layer, MAC layer, networking, security and link management.
- 5. Mobile network Layer :** Mobile IP-goals, assumption, requirement, entities, terminology, IP packet delivery.
Agent advertisement and discovery, registration, tunneling, encapsulation, optimization, reverse tunneling, IPv6.
DHCP. Adhoc Networks-routing, destination sequence distance vector, dynamic source routing, hierarchical algorithm, algorithm, alternative metric.
- 6. Mobile Transport Layer:** Traditional TCP, Indirect TCP, Snooping; TCP, Mobile TCP fast retransmission, Transaction oriented TCP.
- 7. Support for Mobility:** File, System, WWW-HIT,HTML, system architecture. WAP architecture, wireless datagram, protocol, wireless transport layer security, wireless transaction protocol, application environment, telephony application.

Text Books:

1. Jochen Schiller, "Mobile Communication", Pearson Education.
2. Lee, "Mobile Cellular Telecommunications" McGRAW-Hill.
3. Wireless Communications : Theodore S Rappaport; Pearsons

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

Elective II

MTCE- 608A SOFTWARE VERIFICATION, VALIDATION AND TESTING

| | | | | | |
|--------------|---|-------|---|---|---|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **Introduction:** Definition of testing, goals, psychology, model for testing, effective testing, limitations of testing.
2. **Testing terminology and Methodology:** Definitions of Failure, faults or bug, error, incident, test case, test ware, life cycle of bug, bug effects, bug classification, test case design, testing methodology, development of test strategy, verification, validation, testing life cycle model, testing techniques, testing principles.
3. **Verification and validation:** Verification activities, verification of requirements, verification of HL design, verification of data design, verification of architectural design, verification of UI design, verification of LL design, intro to validation activities.
4. **Black Box testing:** Boundary value analysis, equivalence class partitioning, state table based testing, decision table based, graph based testing, error guessing.
5. **White Box testing:** Logic coverage criteria, basic path testing, graph matrices, loop testing, data flow testing, mutation testing.
6. **Static testing:** Types of static testing, technical reviews, inspections, inspection process, structured walk through, walk through process, adv. of static testing.
7. **Validation Testing:** Unit testing, drivers stubs, integration testing, methods, effect of module coupling and cohesion, functional testing, system testing, recovery testing, security testing, stress testing, performance testing, usability testing.
8. **Test Automation and debugging:** S/w measurement and testing, testing metrics, tools, debugging design of practical test cases, reducing no of test cases, regression testing and test case mgmt.

Text Books:

1. Software Engg. By Pressman
2. Software Engg. By Dr. K.K. Aggarwal & Yogesh Singh
3. Software Engg. By Jawadekar
4. Software Testing By Aditya Mathur, Pearson Edu

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTIT- 608A
ENTERPRISE RESOURCE PLANNING

| | | | | |
|-----------------------|--------------|----------|----------|----------|
| Theory Marks : | 100 | L | T | P |
| Sessional : | 50 | 4 | 0 | 0 |
| Total : | 150 | | | |
| Time : | 3 hrs | | | |

1. **ERP: Enterprise Perspective:** An Overview, Features of ERP, MIS Integration, ERP drivers, Trends in ERP, ERP in India.

2. **ERP: System Perspective:** Management Information System, Operations Support System, DSS, Transaction Processing System, Network Structure of ERP System, ERP Work flow, Process modeling for ERP Systems, Communication in ERP Systems, OLTP, (On Line Transaction Processing), OLAP (On Line Analytical Processing), Enterprise Integration Application Tools for ERP.

3. **ERP: Resource Management Perspective:** Business Modules in ERP Packages, Finance, Production, Human Resource, Plant Maintenance, Materials Management, Quality Management, Sales and Distribution, Resource Management, Business Process Reengineering, Relationship between ERP & BPR, ERP Implementation Life Cycle, Implementation methodology, ERP Project Management & Monitoring.

4. **ERP: Key Issues:** ERP and E,Commerce, ERP Culture, ERP and CRM, ERP and SCM, ERP Selection Issues, ERP in Public Sector Enterprises, Pre and Post Implementation Issues, ERP Vendors, Key ERP Consultants in India, Future Directions in ERP.

Text Books:

1. Alexis, Leon, ERP Demystified. Tata McGraw Hill.
2. Garg, V.K. and Venket, Krishna, N.K., ERP Concepts and Practices, PHI Publications.
3. Sadagopan, S. ERP: A Managerial perspective. Tata McGraw Hill.
4. Langenalter, A. Gary, Enterprise Resources Planning and Beyond. St. Lucie Press, USA.
5. Imhoff, C. Loftis Lisa & Geiger, G. Jonathan, Building the Customer Centric Enterprise. John Wiley & Sons.
6. Shankar, Ravi & Jaiswal, S., Enterprise Resource Planning. Galgotia Publications.
7. Diwan, Parag & Sharma, Sunil, Enterprise Resource Planning: Manager's Guide. Excel Books.

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

**MTCE-610A
OPERATING SYSTEM LAB**

| | | |
|----------|----------|----------|
| L | T | P |
| 0 | 0 | 4 |

Practical based on theory paper Distributed Operating System

**MTCE-612A
SOFT COMPUTING LAB**

| | | |
|----------|----------|----------|
| L | T | P |
| 0 | 0 | 4 |

Practical based on theory paper Soft Computing

**MTIT-612A
SEMINAR**

| | | |
|----------|----------|----------|
| L | T | P |
| 0 | 0 | 2 |

On the latest topic

III Semester
MTCE-701A
KNOWLEDGE BASED SYSTEM DESIGN

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. Introduction of Logic, Propositional Logic concepts, Semantic Tableaux and Resolution in Propositional logic, FOPL, Semantic Tableaux and Resolution in FOPL, Logic Programming in Prolog.
2. Knowledge representation, semantic nets, partitioned nets, parallel implementation of semantic nets. Frames, Common Sense reasoning and thematic role frames, Architecture of knowledge based system, Rule based systems, forward and backward chaining, Frame based systems.
3. Search techniques. Uninformed Search, DFS, BFS, Iterative deepening Heuristic Search, A*, Hill Climbing etc.
4. Uncertainty management in Expert Systems, Fuzzy Logic, Probabilistic Methods, Bayesian Theory, Dempster Shafer Theory, Bayes Network, introduction to agents and their application to intelligent systems.

Text Books:

1. "Artificial Intelligence – Structures and Strategies for Complex Problem Solving", George F. Luger, Pearson Education.
2. "Artificial Intelligence", Elaine Rich and Kevin knight, Tata McGraw Hill
3. "Artificial Intelligence" by Nilsl J Nilson
4. "Artificial Intelligence: a Modern Approach" Russell & Norvig, ,Pearson Education

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTIT- 703A
DATA WAREHOUSING AND DATA MINING

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction:** Introduction to Data Warehousing and data mining, basic elements of data warehousing, Data warehousing vs. OLAP.
- 2. Data model development for Data Warehousing:** business model, selection of the data of interest, creation and maintaining keys, modeling transaction, data warehousing optimization, Data warehousing methodologies, type and comparisons.
- 3. Data Mining:** Data mining techniques, data mining algorithms, classification, Decision, Tree based Classifiers clustering, Association, Rule Mining Information Extraction using Neural Networks, Knowledge discovery, KDD environment.
- 4. Visualization:** data generalization and summarization, based characterization, Analytical characterization: analysis of attribute relevance, mining class Comparison, Discriminating between classes, mining descriptive statistical measures in large database.
- 5. Data mining primitives, languages & system architectures:** data mining primitives, Query language, designing GUI based on a data mining query language, architectures of data mining systems.
- 6. Application and trends in data mining:** Applications, systems products and research prototypes, multimedia data mining, indexing of multimedia material, compression, space modeling.
- 7. Advanced topics:** Web mining: web content mining, web structure mining, web usage mining, spatial mining, temporal mining.

Text books:

1. Paulraj ponniah, "Web warehousing fundamentals" – John Wiley.
2. M. H. Dunham, "Data mining introductory and advanced topics" – Pearson education
3. Han, Kamber, "Data mining concepts and techniques", Morgan Kaufmann
4. Imhoff, Galemme, Geiger, "Mastering data warehouse design", Wiley Dreamtech

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 705A
SYSTEM AND NETWORK ADMINISTRATION

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **N/w Administration:** Introduction to networks, TCP/IP model, IP addressing, Subnetting NAT, VLAN. Basic Concepts of proxy server, web server, DNS, Firewall, Router, Mail Server and their respective configuration settings. Various Interconnecting Devices; Hub, Switch, Bridges, Routers, Gateway, repeater, brouter. Knowledge about various network related commands : ping, netstat, tracert, traceroute, ifconfig, ipconfig etc. Steps followed in establishing a network.
2. **Security:** Concept of Security, its need, issues, cryptography techniques :ciphers, substitution cipher, transposition, symmetric key algorithms like AES, DES, public key algo's like RSA, Authentication algorithms IPSEC, VAN, Digital Signatures, IDS, Firewall. Types of attacks, access control list, filtering rules.
3. **Host Administration:** Introduction to system Administration, what are the necessary issues to be tackled in host management, installation of Unix, Linux, windows OS, formatting file systems like FAT, NTFS, etc., Booting process in various OS, User accounts, group accounts, passwords, shadow passwords, directory structure of analysis of host machine and how to improve the systems performance.
4. **Unix Commands:** Knowledge of UNIX commands, administration based commands, Shell scripting, AWK, Perl.

Text Books:

1. Brain Kemighen & Rob Pike “The unix programming environment”
2. Maurice Bach “Design of the Unix operating system”
3. Stephen Prato “Advanced Unix programmer's Guide”
4. Sumitabha Das “ Unix Concepts and applications-Featuring SCO Unix and Linux”

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

ELECTIVE-III

MTIT- 707A SOFTWARE QUALITY ASSURANCE

| | | | | | |
|--------------|---|-------|---|---|---|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

- 1. Introduction:** Introduction to software quality, challenges, objectives, quality factors, components of SQA, contract review, development and quality plans, SQA components in project life cycle, SQA defect removal policies, Reviews
- 2. Basics of software testing:** 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
- 3. Test Strategies:** 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
- 4. Software Quality:** Hierarchical models of software quality , software quality metrics ,function points , Software product quality , software maintenance quality , effect of case tools , software quality infrastructure , procedures , certifications , configuration management , documentation control.
- 5. Project process control:** Project progress control , costs , quality management standards , project process standards , management and its role in SQA , SQA unit

Text Books:

1. Daniel Galin, Software quality assurance , from theory to implementation , Pearson education.
2. Aditya Mathur, Foundations of software testing, Pearson Education
3. Srinivasan Desikan and Gopaldaswamy Ramesh, Software testing , principles and practices , Pearson education

Reference Books:

1. Ron Patton, Software testing , Pearson education
2. Alan C Gillies, “Software Quality Theory and Management”, Cengage Learning

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

MTCE- 707A
SECURITY IN INFORMATION SYSTEM

| | | | | | |
|---------------------|----------|--------------|----------|----------|----------|
| Theory Marks | : | 100 | L | T | P |
| Sessional | : | 50 | 4 | 0 | 0 |
| Total | : | 150 | | | |
| Time | : | 3 hrs | | | |

1. **Encryption and De-encryption:** Terminology and Background: cryptosystems, Plain Text and cipher.
Encryption algorithms, crypt analysis. introduction to ciphers, Monoalphabetic, substitutions, polyalphabetic.
2. **Secure encryption systems:** Hard problems : complexity NP-complete problems, characteristics of NP complete, the meaning of NP completeness, NP completeness and cryptography, properties of arithmetic operations, inverse, primes, GCD, modular arithmetic, properties of modular arithmetic, computing the inverse, Fermat's theorem, algorithms for computing inverses, random number generation.
3. **Public key encryption systems:** concept and characteristics, introduction to merkle-hellman knapsacks, RSA, Digital signatures, DSS.
4. **Hash Algorithms :** hash concept, description of hash algorithms, MD4,MD5,SHA1,SHA2
Secure Secret key systems : DES, AES Applied cryptography, protocols, practices, key management protocols Operating system, database, program security, Network Security

Text Books:

1. Security in Computing -Charles P Pfleeger, Prentice-Hall International, Inc
2. Applied Cryptography Protocols, Algorithms and Source Code in C, Bruce Schneier, John Wiley.
3. Security Technologies for the World Wide Web, Rolf Oppliger, Artech House, Inc.
4. Digital Certificates Applied Internet Security, Jala Fegghi, Jalli Fegghi and Peter Williams, Addison Wesley Longman.

Note:

1. In the semester exam., the examiner will set 08 questions in all covering the entire syllabus. Students will be required to attempt any five questions.
2. Use of scientific calculator will be allowed in the exam. However, Pager, Programmable Calculator & Cellular Phone etc. will not be allowed.

**MTCE-709A
AILAB**

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 4 |

Practicals based on theory paper Knowledge based system design

**MTIT-711A
MINOR PROJECT**

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 4 |

Student required to complete a running project.

**MTIT-713A
SEMINAR**

| L | T | P |
|----------|----------|----------|
| 0 | 0 | 2 |

On the latest topic

**IV Semester
MTIT-702A
Dissertation & viva**

The student will submit a synopsis at the beginning of the semester for the approval from the project committee in a specified format. Final Synopsis must be submitted within two weeks. Dissertation report must be submitted in a specified format to the project committee for evaluation purpose at the end of semester.