Maharshi Dayanand University
Rohtak

Syllbus and Courses of Reading for

M.Tech. (Computer Science & Engineering)

Examination

Session 2011-12

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M.D. UNIVERSITY, ROHTAK (HARYANA)

SCHEME OF STUDIES & EXAMINATION FOR MASTER OF TECHNOLOGY COURSE IN COMPUTER SCIENCE & ENGINEERING-2011-12

SEMESTER-I

Course No.	Course Title	Teaching Schedule				Mark		Credits	Duration of Exam
		L	T	P	Sessional	Exam	Total		
MTCE-601A	Computer system software	4	-	-	50	100	150	4	3
MTCE-603A	Mathematical foundation of Computer Science	4	-	-	50	100	150	4	3
MTCE-605A	Analysis and Design of Algorithms	4	-	-	50	100	150	4	3
MTCE-607A	Elective I	4	-	-	50	100	150	4	3
MTCE-609A	OOPS lab.	-	-	4	50	50	100	4	3
MTCE-611A	Internet lab	-	-	4	50	50	100	2	3
MTCE-613A	Seminar	-	-	2	50	-	50	1	-
Total		16	-	10	350	500	850	21	-

ELECTIVE-1

MTCE 607(A)Internet & Web Technology

MTCE 607(B) Embedded Systems

Note :

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus and the same will be evaluated on marks.
2. The Sessionable of Theory /Practical Courses shall also be evaluated on the basis of marks.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.

M.D. UNIVERSITY, ROHTAK (HARYANA)

SCHEME OF STUDIES & EXAMINATION FOR MASTER OF TECHNOLOGY COURSE IN COMPUTER SCIENCE & ENGINEERING

SEMESTER-II

Course No.	Course Title	Teaching Schedul				Marks		Credits	Duration of Exam
		L	T	P	Sessional	Exam	Total		
MTCE-602 A	Soft Computing	4	-	-	50	100	150	4	3
MTCE-604A	Resource Management in Com. Syt.	4	-	-	50	100	150	4	3
MTCE-606A	Mobiles & Wireless Communication	4	-	-	50	100	150	4	3
MTCE-608A	Elective II	4	-	4	50	100	150	4	3
MTCE-610A	Operating System Lab.	-	-	4	50	50	100	2	3
MTCE-612A	Soft Computing Lab.	-	-	2	50	50	100	2	3
MTCE-614A	Seminar	-	-	2	50	-	50	1	-
Total		16	-	10	350	500	850	21	-

ELECTIVE-1I

MTCE 608(A) Software Verification Validation & Testing

MTCE 608(B) Advanced Microprocessors

Note :

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus and the same will be evaluated on marks.
2. The Sessionable of Theory /Practical Courses shall also be evaluated on the basis of marks.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.

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SCHEME OF STUDIES & EXAMINATION FOR MASTER OF TECHNOLOGY COURSE IN
COMPUTER SCIENCE & ENGINEERING

SEMESTER-III

Course No.	Course Title	Teaching Schedul				Marks		Credits	Duration of Exam
		L	T	P	Sessional	Exam	Total		
MTCE-701A	Knowledge based system design	4	-	-	50	100	150	4	3
MTCE-703A	Advanced database management syt.	4	-	-	50	100	150	4	3
MTCE-705A	System & Network Administration	4	-	-	50	100	150	4	3
MTCE-707A	Elective III	4	-	-	50	100	150	4	3
MTCE-709A	Al lab	-	-	4	50	100	150	4	3
MTCE-711A	Minor Project	-	-	4	50	50	100	2	3
MTCE-713A	Seminar	-	-	2	50	-	50	1	-
Total		16	-	10	350	500	850	21	-

ELECTIVE-1II

MTCE 707A(A) Software Project Management

MTCE 707A(B) Security of Information Systems

Note :

1. The paper setter shall set each theory paper of 100 marks covering the entire syllabus and the same will be evaluted on marks.
2. The Sessionable of theory/Practical Courses shall also be evaluated on the basis of marks.
3. The choice of students for any elective shall not be binding on the Deptt. to offer it.

M.D. UNIVERSITY, ROHTAK (HARYANA)
SCHEME OF STUDIES & EXAMINATION FOR MASTER OF TECHNOLOGY COURSE IN
COMPUTER SCIENCE ENGINEERING

SEMESTER-IV

Course No.	Course Title	Marks			Credits
		Sessional	Exam	Total	
MTCE-702 A	Dissertation & Viva	100	400	500	12

Note :

The university shall combine both sessional and external exam. marks and compute the overall grade of the subject on the guidelines approved by the university.

M.D. UNIVERSITY, ROHTAK (HARYANA)
Scheme of Grading System (I to IV Semesters)
Master of Technology Degree Course(M.Tech)

The grade awarded to a student in any particular course will be based on his/her performance in class work, attendance, seasonal tests, tutorial tests, home assignments, laboratory work, viva-voce examination, main examination, etc.

The letter grades that can be awarded & their equivalent grade point are listed below :

1st Semester

MTCE 601A

COMPUTER SYSTEM SOFTWARE

Theory Marks	**:**	**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Introduction to Object Oriented Programming and Object Oriented Design.

Concepts of classes, objects, abstraction, encapsulation, inheritance, function overloading, virtual functions, function overiding, templates.

Object modeling : Class and object diagrams, association, aggregation, generalization, dynamic modeling and functional modeling.

Introduction to UML : Class diagrams, Use cases, interaction diagrams, collaboration diagrams, deployment diagrams.

Principles of class design : Open close principle, Liskov's substitution principle, dependency inversion principle, package cohesion principle etc.

System Software design issue. Design of assemblers, macro processors, linkers and loaders, dynamic linking.

References

1. Object Oriented Programming with C++ By Robert Lafore
2. Object Oriented Modeling and Design By James Rumbagh
3. System Programming By Dhamdhere
4. System Programming By Donovan
5. Object Oriented Analysis & Design By Grady Booch

MTCE 603A
MATHEMATICAL FOUNDATIONS OF COMPUTER SCIENCE

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Regular Grammar and Finite automata,NDFA and DFA, NDFA to DFA conversion, Pumping Lemma to checking the regularity of regular grammars, Reduction of states and design of equivalent finite automata, Context Free Grammar, possible defects in CFG and their removal, Chomsky and Greibach Normal Form. Push down automata, design of CFG corresponding to PDA and vice versa, Design of parser using PDA, Linear bound automata.

Turing machines as language recognizer, computer for positive integers, enumerator, universal Turing machine, halting problem, multi-tape and multi-head turing machine, Post Machine, solvability and undecidability, Rice's theorem, equivalence of general recursive and Turing computable function, primitive recursive function, post correspondence problem. Introduction to complexity theory, space and time complexity of turing machine.

References

1. Introduction to automata theory, language & computation- Hopcroaft & O.D. Ullman, R Mothwani, 2001, AW
2. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ.
3. Fundamentals of the Theory of Computation-Principles and Practice by Ramond Greenlaw and H.James Hoover, 1998, Harcourt India Pvt. Ltd.
4. Elements of theory of computation by H.R. Lewis & Ch. Papaditriou, 1998, PHI.
5. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

MTCE 605A
ANALYSIS & DESIGN OF ALGORITHMS

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Unit 1 : Analyzing Algorithms & Problems

Introduction to algorithms, Time and Space Complexity, Basic elements of data structures like linked, stacks and queues, trees, graphs, recursion. Different types of sorting algorithms and their complexities.

Unit 2 : Dynamic Sets, Searching and Graphs

Introduction, Array, amortized time analysis, red black trees, hashing, heaps, dynamic equivalence relations and union-find programs, priority queues with decrease key operations, traversing graphs, DFS, strongly connected components, biconnected componenets, minimum spanning tree , single source shortest paths, all pair shortest paths.

Unit 3 : Greedy and Dynamic Methods

Introduction to greedy and dynamic methods, their algorithms, and comparative study.

Unit 4 : Backtracking and Branch-and-bound

General backtracking and Branch and Bound Methods, 8 queen, sum of subset, graph coloring, Hamilton cycles,0/1 knapsack problem.

Unit 5 : NP-Hard and NP Complete problems

Basic Concepts, cooks theorem, NP-Hard graph problems, NP hard Scheduling

Unit 6 : Parallel Algorithms

Introduction, parallelism, PRAM and other models, some simple PRAM algorithms, handling write conflicts, Merging and Sorting, finding Connected Components.

Unit 7 : Approximation Algorithms

Introduction, Absolute Approximation, e-approximation, polynomial time approximation schemes, fully polynomial time approximation schemes, String matching algorithms.

References :

Fundamentals of Computer Algorithms	Sartaj Sahni, Ellis Horowitz
Design and Analysis of Algorithms	AV Aho, E Hoproft, JD Ullman
Fundamental Algorithms (The Art of Computer Programming Vol. I)	DE Knuth
A Discipline of Programming	ED Dijkstra
Writing Efficient Programs	Jon DL Bently

MTCE 607A (A)
INTERNET & WEB TECHNOLOGY

Theory Marks	**:**	**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**
		150			
Total					
Time	**:**	**3 hrs.**		**Credits : 4**	

Unit 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.

Unit 2 : Router Technology

Hubs, Bridges, Routers, Routing Protools, Routing Security, switch based routing, routing in unicast enviroment, multicasting, mobile routing.

Unit 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.

Unit 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.

Unit 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.

Reference Books :

1. Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp-2001, TMH.
2. Internet & World Wide Programming, Deitel, Deitel & Nieto, 2000 Pearson Education.
3. Beginning XHTML by Frank Boumpery, Cassandra Greer, Dave Ragett, Jenny Raggett, Subastian Schnitenbaumer & ted Wugofski, 2000, WROX press (Indian shroff Publ. SPD) Ist edition.
4. Complete reference guide to java script, Aron Weiss, QUIE, 1997
5. Intranet & Internet Engg. By Minoli
6. Internet & Web Technology By Rajkamal.

MTCE 607A (B)
EMBEDDED SYSTEMS

Theory Marks	**:**	**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**
		150			
Total					
Time	**:**	**3 hrs.**		**Credits : 4**	

Real time operating system overview, Exposure to Windows CE, QNX, Micro kernels Introduction to process models. Interrupt routines in an RTOs environment, encapsulation semaphores and queues, hard real-time scheduling considerations, saving memory space.

16 & 32 bit microprocessors and micro controller and DSP hardware with reference to Embedded system.

Embedded software development tools and compilers-host: and target machines linkers/locators for embedded software, cross compilers, cross assembles and tool chairs, GCC compiler, basic concepts of device drivers, serial communication interface device driver. System

synthesis of Harware/Software co-emulation, simulation, speed of emulators. JTAGOCD.

Communication protocols with special reference to embedded system.TCP/IP,UDP wireless protocols, IRDA, Blue tooth IEEE 8.2.11.

References :

1. An embedded system primer by devid E Simon Addison Wesley, 1999.
2. Programming for Embedded system by Dreamtch software team.
3. Embedded System design by Rajkamal (TMH)
4. Embedded Real Time System Programming by lyer Gupta (TMH)

MTCE 611A
OOPS lab

L	T	P
4	0	0

Credits : 2

Practicals based on theory paper Computer System Software

MTCE 613A
Internet lab

L	T	P
4	0	0

Credits : 2

Practicals based on theory paper Elective I

2nd Semester

MTCE 602A
SOFT COMPUTING

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**
		150			
Total					
Time	**:**	**3 hrs.**		**Credits : 4**	

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.

Fuzzy Logic : Introduction to fuzzy Logic, Classical and Fuzzy Sets, Overview of Classical Sets, Membership Function, Fuzzy rule generation.

Operations on Fuzzy Sets : Compliment, Intersection, Union, Combination of Operations, Aggregation Operation.

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.

Uncertainty based information : Information & Uncertainty,

Nonspecificity of Fuzzy & Crisp Sets, Fuzziness of Fuzzy Sets.

References :

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

MTCE 604A
RESOURCE MANAGEMENT OF COMPUTER SYSTEMS

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Historical perspectives, concurrent process; mutual exclusion and synchronization, system calls and protection; context switching and the notion of a process and threads; synchronization and protection issues, scheduling memory management including virtual memory and paging techniques;I/0 architecture and device management, proces deadlocks-models of deadlock resources; graph reduction method, deadlock detection, prevention and avoidance.

Distributed operating : Architecture, design issues, Lamport's logic clocks, vector clocks, causal ordering of messages, distributed mutual exclusion, token and non token based algorithms. Distributed file system Mechanism for building DFS, design issues of DFS, case studies, Protection and security, access matrix model, implementation of access matrix model usir the capabilities, access control list, lock & key methods. Advance model Advance models : Take grant method, Bell La Padula method.

Case studies. Laboratory experiments on internals of Linux, Windows NT.

References :

1. Design of the Unix operating system — Maurice Bach
2. Distributed Operating System — Tanenbaum
3. Principles of Operating System — William Stallings

MTCE 606A
MOBILE AND WIRELESS COMMUNICATION

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Unit 1 : Introduction

Application, history, market, reference model and overview. Wireless Transmission-Frequencies, signals, antennae, signal

propagation, multiplexing, modulation, spread spectrum, cellular system.

MAC and Telecommunication System :

Specialized MAC, SDMA, FDMA, TDMA-fixed TDM, classical ALOHA, Slotted, ALOHA, CSMA, DAMA, PKMA, reservationTDMA. 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.

Satellite and Broadcast Systems :

History, Applications, GEO, LEO, MEO, routing, localization, handover in satellite system. Digital audio and video broadcasting.

Wireless LAN :

IEEE 802 11-System and protocol architecture, physical lyer.MAC layered management. Bluetooth-User scenarios, physical lyer, MAC layer, networking, security and link management.

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.

Mobile Transport Layer :

Traditional TCP, Indirect 'TCP, Snooping ;TCP, Mobile TCP fast retransmission, Transaction oriented TCP.

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.

References :

1. Jochen Schiller,"Mobile Communication", Pearson Education, 2002.
2. Lee,"Mobile Cellular Telecommunications" McGRAW-Hill, 2nd Edition.
3. Wireless Communications : Theodore S Rappaport; Pearsons

Elective II MTCE 608A(A)
SOFTWARE VERIFICATION, VALIDATION AND TESTING

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Unit 1 : Introduction
Definition of testing, goals, psychology, model for testing, effective testing, limitations of testing.

Unit 2 : Testing terminology and Methodology
Defs 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.

Unit 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.

Unit 4 : Black Box testing
Boundary value analysis, equivalence class partitroning, state table based testing, decision table based, graph based testing, error guessing.

Unit 5 : White Box testing
Logic coverage criteria, basic path testing, graph matrices, loop testing, data flow testing, mutation testing.

Unit 6 : Static testing
Types of static testing, technical reviews, inspections, inspection process, structured walk through, walk through process, adv. of static testing.

Unit 7 : Validation Testing
Unit testing, drivers stubs, integration testing, methods, effect of module coupling and cohesion, functional testing, sytem testing, recovery testing, security testing, stress testing, performance testing, usability testing.

Unit 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.

Reference :

1. Software Engg. By Pressman
2. Software Engg. By Dr. K.K. Aggarwal & Yogesh Singh
3. Software Engg. By Jawadekar
4. Software Engg. By Sheeman

MTCE 608A(B)
ADVANCED MICROPROCESSORS

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Architecture of 8086/8088-Digital Computers, Microprocessors, 8086/8088, Architecture, Memory Organization, Addressing Modes, Assembly directives, Symbols, Variables and constants, Data Definition and storage allocation directives, structure, records, Assigning Names to Expressions, Segment Definition, alignment directives, Value Returning Attribute-operators.

The 8086/8088-Instructions-Instruction formats, instruction execution Timing,, assembler, instruction format, Data transfer Instruction,

Arithmetic Instruction, Branch Instruction, and conditional and unconditional, loop instructions, NOP and HLT instructions. Flag manipulation instructions, logical instructions, Shift and Rotate Instructions, String Instructions. Assembly Language Programming . Advanced Processors-Introduction, Intel 80286, Intel 80386, Intel 80486, Intel Pentium and Intel Pentium Proprocessor-Internal Block Diagram Only.

I/O Programming-Fundamentals, I/O Considerations, Programmed I/O, Block, Transfer & DMA. Interrupt I/O Design Example.

Basic 8086/88 Minimum Mode, maximum mode interrupt priority management based on single and multiple 8259, I/O interfaces, Asynchronous, Synchronous, data transfer 8231A Programmable Communications interface, 8255 A Programmable Peripheral Interface. Micro Processor Application-Data Acquisition system, Temperature Monitoring,Speed Control etc.

References :

1. Microprocessors and interfacing : D.V.Hall; TMH
2. The 8088 & 8086 Microprocessors-Programming, interfacing, Hardare & Application : Triebel & Singh; PHI
3. Microcomputer systems; the 8086/8088 Family : Architecture, Programming & Design : Yu-Chang Liu & GlennA Gibson; PHI.
4. Microprocessors By Berry
5. Advanced Microprocessors and Interfacing : Badri Ram; TMH

MTCE 610A
Operating System Lab

L	T	P
0	0	4

Credits : 2

Practicals based on theory paper Resource Management in Computer Systems.

MTCE 612A
Soft Computing Lab

L	T	P
0	0	4

Credits : 2

Practicals based on theory Soft Computing

3rd Semester

MTCE 701A
KNOWLEDGE BASED SYSTEM DESIGN

Theory Marks	**:**	**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**
Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Introduction ot Logic, Propositional Logic concepts, Semantic Tebleaux and Resolution in Propositional logic, FOPL, Semantic Tebleaux and Resolution in FOPL, Logic Programming in Prolog.

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.

Search techniques. Uninformed Search, DFS, BFS, Iterative deepening Heuristic Search, A*, Hill Climbing etc.

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.

References :

1. Artificial Intelligence — Nilsl J Nilson
2. Artificial Intelligence — Elain Rich and Kevin knight
3. Artificial Intelligence-A modern approach — Staurt Russel and Peter norvig
4. Artifical intelligence — Patrick Henry Winston

MTCE 703A
ADVANCED DBMS

Theory Marks :	**100**	**L**	**T**	**P**
Sessional :	**50**	**4**	**0**	**0**

Total	**150**			
Time :	**3 hrs.**		**Credits : 4**	

Introduction : Architecture. Advantages, Disadvantages, Data models, relational algebra, SQL, Normal forms.

Query Processing : General strategies for query processing, transformations, expected size, statistics in estimation, query improvement, query 'evaluation, view processing, query processor.

Recovery : Reliability, transactions, recovery in centralized DBMS, reflecting updates, Buffer management, logging schemes, disaster recovery.

Concurrency : Introduction, serializability, concurrency control, locking schemes, timestamp based ordering, optimistic scheduling, multiversion techniques, deadlocks.

Object Oriented Data base Development : Introduction, Object definition language, creating object instances, Object query language.

Distributed Databases : Basic concepts, options for distributing a database, distributed DBMS.

Data warehousing : Introduction, basic concepts, data warehouse architecture, data characteristics, reconciled data lyer, data transformation, derived data layer, user interface.

Object Relational Databases : Basic concepts, enhanced SQL, advantages of object relational approach.

References :

1. An Introduction to database systems by Bipin C. Desai, Galgotia Publications.
2. Modern Database Management by Feffray A. Lioffer, Mary B. Prescotl, Fred R Mcfadden, 6th edition, Pearson Education.
3. Principles of distributed database systems, by M.Tamer & Valduriez, 2nd edition, LPE Pearson education.
4. Database system concepts by Korth.

MTCE 705A
SYSTEM AND NETWORK ADMINISTRATION

L	**T**	**P**
4	**0**	**0**
	Credits : 4	

Unit 1 : N/w Administration

Introduction to networks, TCP/IP model, IP addressing, Subnetting NAT, VLAN. Basic Concepts of proxy server, webserver, 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, ifconfg, ipconfig etc. Steps folowed in establishing a network.

Unit 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.

Unit 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.

Unit 4 : Knowledge of UNIX commands, administration based commands, Shell scripting, AWK, Perl.

References :

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

MTCE 707 A (A)
SOFTWARE PROJECT MANAGEMENT

Theory Marks :		**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**

Total		**150**			
Time	**:**	**3 hrs.**		**Credits : 4**	

Project Life Cycle Models : What is a Project Life Cycle Model. A Framework for studying different life cycle models. The waterfall model, The prototyping model, The rapid Application Development (RAD) model, The spiral model and its variants. Process Models Characteristics of a process, what constitutes and effective process why are the processes important, Process models, Common misconceptions about processes.

Metrics : The metrics roadmap, Atypical metrics strategy, what should you measure, Set targets and track them, Understanding and trying to minimize variability, Act on data, People and organizational isses in metrics programs, Common pitfalls to watch out for in Metric programs, Metrics Implementation checklist and tools.

Software Configuration Management : The processes and activities of software Configuration management, configuration status accounting Configuration Audit, Software configuration management in geographically distributed teams, Metrics in software configuration management, Software configuration management tools and automation.

Software Quality' Assurance : How do you define quality, why is quality important in software, quality control and quality assurance, Cost and benefits of quality, Software quality analyst's functions, Some popular misconceptions about the SQA's role, Software quality assurance tools Organizational Structures, Profile of a successful SQA, Measures of SQA success, Pitfalls to watch out for in the SQA's role.

Risk Management : What is risk management and why it is important Risk Management Cycle, Risk Identification; Common Tools and Techniques, Risk quantification, Risk Monitoring, Risk mitigation. Risks and mitigation in the context of Global Project Teams. Some Practical Techniques in Risk Management, Metrics in risk management.

Project Initiation : Activities during project initiation, Outputs, quality records and completion criteria for the project intimation phase, Interfaces to the process database.

Project Planning and Tracking : Components of project planning and tracking. The "What Cost" part of a Project Plan, the "When" part of project planning. The "How" part of a project plan. The "By Whom" part of a Project management Plan, Putting it all together. The software project management plan, Activities specific to project tracking, Interfaces to the process database.

Project Closure : When does project closure happen. Why should we explicitly do a Closure? An Effective Closure process, Issues that Get Discussed During Cloure, Metrics for Project Closure, Interfaces to Process Database.

Software Requirements Gathering : Inputs and Start Criteria for requirements Gathering, Dimensions of Requirements Gathering, Steps to be followed during requirements, gathering, Outputs and Quality records from the requirements phase, Skill Sets required during the requirements phase.Differences for a shrink-wrapped Software, Challenges During the Requirements Management Phase, Metrics for the Requirements Phase.

Estimation : What is estimation? When and why is estimation done?.The three phases of estimation, Estimation Methodology, Formal models for size estimation, Translating size estimate into effort Estimate, Translating effort estimates into schedule estimates, Common challenges during estimation, Metrics for the estimation processes. Design and Development Phases : Some differences in our chosen approach. Silent features of design, Evolving an Architecture/Blueprint, Design for Reusability, Technology choices/constraints, Design of standards, Design of portability, User interface issues, Design for testability, Design for Diagnosability, Design for insall ability Inter-operability design, Inter-operability design, Challenges during design and development phases, Skill sets for design, Challenges during design and development phases, Skill sets for design and development, Metrics for design and development phase. Project Management in Testing Phase; What is testing, What are the activities that make up Testing?, The Scheduling and types of tests, People issues in testing, Management structures for testing in global teams, Metrics for Testing Phase. Project Management in the Maintanance phase : Activities during the maintenance phase, Management issues during the

maintenance phase, Configuration management during the maintenance phase, Skill sets for people in the maintenance phase, Estimating size, effort and people resources for the maintenance phase, Advantages of using geographically distibuted teams for the maintenance phase, metrics for the maintenance phase.

References :

1. Gopalaswamy Ramesh, "Managing Global Software Projects" TMH Publishing Company, New Delhi. (2001).
2. Tom Demarco, Controlling Software Project Management, Measurement, Prentice Hall, New Jersey. (1982).
3. Tom Glib, Finzi Susannah, Principls of Software Engineering Management, Addison Wesley, England.

MTCE 707 A (B)
SECURITY OF INFORMATION SYSTEMS

Theory Marks	**:**	**100**	**L**	**T**	**P**
Sessional	**:**	**50**	**4**	**0**	**0**
		150			
Total					
Time	**:**	**3 hrs.**		**Credits : 4**	

Encryption and De-encryption

Terminology and Background : cryptosystems, Plain Text and cipher. Encryption algorithms., crypt analysis. introduction to ciphers, Monoalphabetic, substitutions, polyaphabetic.

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.

Public key encryption systems: concept and characteristics, introduction to merkle-hellman knapsacks, RSA, Digital signatures, DSS.

Hash Algorithms : hash concept, description of hash algorithms, MD4,MD5,SHAI,SHA2

Secure Secret key sytems : DES, AES

Applied cryptography, protocols, practices, key management protocols

Operating system, database, program security,

Network Security

References Books

1. Security in Computing (Second Edition)-Charles P Pfleeger, 1996, Prentice-Hall International, Inc
2. Applied Cryptography Protocols, Algorithms and Source Code in C (Second edition), Bruce Schneier, 1995, John Wiley.
3. Security Technologies for the World Wide Web, Rolf Oppliger, Artech House, Inc.
4. Digital Certificates Applied Internet Security, Jala Feghhi, Jalli Feghhi and Peter Williams, Addison Wesley Longman.
5. The World Wide Web Security FAQ, Lincoln D Stein, World Wide Web consortium (Online) Available at http: www.w3 org/ Security/Faq/www-security-faq.html.
6. Cryptographic Message Syntax Standard, Public-Key Cryptography Standards, RSA Laboratories (online) available at http://www.rsasecurity.com/rsalabs/pkcs-7/inde.html.

MTCE 711 A
Minor Project

L	**T**	**P**
0	**0**	**4**
	Credits : 2	

Practicals based on theory paper

Knowledge Based System Design

MTCE 709 A
AI lab

L	**T**	**P**
0	**0**	**4**
	Credits : 2	

4th Semester

L	**T**	**P**
	Credits : 12	

Dissertation and Viva