

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

**SEMESTER-VI**

S No	Course No.	Course Title	Teaching Schedule				Marks For Class Work	Marks for Examination		Total Marks	Duration of Exam
			L	T	P	Total		Theory	Practical		
1	CSE-206-F	Theory of Automata and Computation	3	1	-	4	50	100	-	150	3
2	CSE-302-F	Principles of Software Engineering	3	1	-	4	50	100	-	150	3
3	CSE-304-F	Intelligent Systems	3	1	-	4	50	100	-	150	3
4	CSE-305-F	Analysis and Design of Algorithms	3	1	-	4	50	100	-	150	3
5	IT-303-F	System Programming and System Administration	3	1	-	4	50	100	-	150	3
6	IT-305-F	Computer Networks	3	1	-	4	50	100	-	150	3
7	EE-402-F	Wireless Communication	3	1	-	4	50	100	-	150	3
8	CSE-306-F	Intelligent Systems Lab	-	-	3	3	25	-	25	50	3
9	CSIT-301-F	UNIX Lab	-	-	3	3	50	-	50	100	3
10	GP-302-F	General Proficiency	-	-	-	-	50	-	-	50	-
		<b>TOTAL</b>	21	7	6	34	475	700	75	1250	

**NOTE:**

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
2. Each student has to undergo practical training of 6 weeks during summer vacation and its evaluation shall be carried out in the VII semester.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section-A

**Finite Automata and Regular Expressions:** Finite State Systems, Basic Definitions Non-Deterministic finite automata (NFA), Deterministic finite automata (DFA), Equivalence of DFA and NFA Finite automata with E-moves, Regular Expressions, Equivalence of finite automata and Regular Expressions, Regular expression conversion and vice versa.

**Introduction to Machines:** Concept of basic Machine, Properties and limitations of FSM. Moore and mealy Machines, Equivalence of Moore and Mealy machines, Conversion of NFA to DFA by Arden's Method.

### Section-B

**Properties of Regular Sets:** The Pumping Lemma for Regular Sets, Applications of the pumping lemma, Closure properties of regular sets, Myhill-Nerode Theorem and minimization of finite Automata, Minimization Algorithm.

**Grammars:** Definition, Context free and Context sensitive grammar, Ambiguity regular grammar, Reduced forms, Removal of useless Symbols and unit production, Chomsky Normal Form (CNF), Griebach Normal Form (GNF).

### Section-C

**Pushdown Automata:** Introduction to Pushdown Machines, Application of Pushdown Machines  
**Turing Machines:** Deterministic and Non-Deterministic Turing Machines, Design of T.M., Halting problem of T.M., PCP Problem.

### Section-D

**Chomsky Hierarchies:** Chomsky hierarchies of grammars, Unrestricted grammars, Context sensitive languages, Relation between languages of classes.

**Computability:** Basic concepts, Primitive Recursive Functions.

**TEXT BOOK:**

1. Introduction to automata theory, language & computations- Hopcroft & O.D.Ullman, R. Mothwani, 2001, AW

**REFERENCE BOOKS:**

1. Theory of Computer Sc. (Automata, Languages and computation):K.L.P.Mishra & N.Chandrasekaran, 2000, PHI.
2. Introduction to formal Languages & Automata-Peter Linz, 2001, Narosa Publ..
3. Fundamentals of the Theory of Computation- Principles and Practice by RamondGreenlaw and H. James Hoover, 1998, Harcourt India Pvt. Ltd..
4. Elements of theory of Computation by H.R. Lewis & C.H. Papaditriou, 1998, PHI.
5. Introduction to languages and the Theory of Computation by John C. Martin 2003, T.M.H.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section-A

Introduction: The process, software products, emergence of software engineering, evolving role of software, software life cycle models, Software Characteristics, Applications, Software crisis. Software project management: Project management concepts, software process and project metrics Project planning, project size estimation metrics, project estimation Techniques, empirical estimation techniques, COCOMO- A Heuristic estimation techniques, staffing level estimation, team structures, staffing, risk analysis and management, project scheduling and tracking.

Requirements Analysis and specification requirements engineering, system modeling and simulation Analysis principles modeling, partitioning Software, prototyping: , Prototyping methods and tools; Specification principles, Representation, the software requirements specification and reviews Analysis Modeling: Data Modeling, Functional modeling and information flow: Data flow diagrams, Behavioral Modeling; The mechanics of structured analysis: Creating entity/ relationship diagram, data flow model, control flow model, the control and process specification; The data dictionary; Other classical analysis methods.

### Section-B

System Design: Design concepts and principles: the design process: Design and software quality, design principles; Design concepts: Abstraction, refinement, modularity, software architecture, control hierarchy, structural partitioning, data structure, software procedure, information hiding; Effective modular design: Functional independence, Cohesion, Coupling; Design Heuristics for effective modularity; the design model; Design documentation. Architectural Design: Software architecture, Data Design: Data modeling, data structures, databases and the data warehouse, Analyzing alternative Architectural Designs, architectural complexity; Mapping requirements Into software architecture; Transform flow, Transaction flow; Transform mapping: Refining the architectural design.

### Section-C

Testing and maintenance: Software Testing Techniques, software testing fundamentals: objectives, principles, testability; Test case design, white box testing, basis path testing:

Control structure testing: Black box testing, testing for specialized environments, architectures and applications. Software Testing Strategies: Verification and validation, Unit testing, Integration testing,; Validation testing, alpha and beta testing; System testing: Recovery testing, security testing, stress testing, performance testing; The art of debugging, the debugging process debugging approaches. Software re-engineering, reverse engineering, restructuring, forward engineering

### **Section-D**

Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal; formal technical reviews: The review meeting, review reporting and record keeping, review guidelines; Formal approaches to SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management.

Computer aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

#### **TEXT BOOK:**

1. Software Engineering – A Practitioner’s Approach, Roger S. Pressman, 1996, MGH.

#### **REFERENCE BOOKS:**

1. Fundamentals of software Engineering, Rajib Mall, PHI
2. Software Engineering by Ian Sommerville, Pearson Edu, 5<sup>th</sup> edition, 1999, AW,
3. Software Engineering – David Gustafson, 2002, T.M.H
4. Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S,
5. An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa,

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### **Section-A**

Foundational issues in intelligent systems: Foundation and history of AI, AI problems and techniques – AI programming languages, introduction to LISP and PROLOG- problem spaces and searches, blind search strategies, Breadth first- Depth first- heuristic search techniques Hill climbing: best first- A \* algorithm AO\* algorithm- game tree, Min max algorithms, game playing- alpha beta pruning.

#### **Section-B**

Knowledge representation issues, predicate logic- logic programming, semantic nets- frames and inheritance, constraint propagation, representing knowledge using rules, rules based deduction systems.

#### **Section-C**

Reasoning under uncertainty, review of probability, Baye's probabilistic interferences and Dempster shafer theory, Heuristic methods, symbolic reasoning under uncertainty, Statistical reasoning, Fuzzy reasoning, Temporal reasoning, Non monotonic reasoning.

#### **Section-D**

Planning, planning in situational calculus, representation for planning, partial order planning algorithm, learning from examples, discovery as learning, Learning by analogy, explanation based learning, neural nets, genetic algorithms.  
Principles of Natural language processing, rule based systems architecture, Expert systems, knowledge acquisition concepts, AI application to robotics, and current trends in intelligent systems.

#### **TEXT BOOK:**

1. Artificial Intelligence: A Modern Approach,. Russell & Norvig. 1995, Prentice Hall.

#### **REFERENCE BOOKS:**

1. Artificial Intelligence, Elaine Rich and Kevin Knight, 1991, TMH.
2. Artificial Intelligence-A modern approach, Stuart Russel and Peter Norvig, 1998, PHI.
3. Artificial intelligence, Patrick Henry Winston, 1992, Addison Wesley 3<sup>rd</sup> Ed.,

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### **Section-A**

Brief Review of Graphs, Sets and disjoint sets, union, sorting and searching algorithms and their analysis in terms of space and time complexity.

Divide and Conquer: General method, binary search, merge sort, quick sort, selection sort, Strassen's matrix multiplication algorithms and analysis of algorithms for these problems.

#### **Section-B**

Greedy Method: General method, knapsack problem, job sequencing with dead lines, minimum spanning trees, single source paths and analysis of these problems.

Dynamic Programming: General method, optimal binary search trees, 0/1 knapsack, the traveling salesperson problem.

#### **Section-C**

Back Tracking: General method, 8 queen's problem, graph colouring, Hamiltonian cycles, analysis of these problems.

Branch and Bound: Method, 0/1 knapsack and traveling salesperson problem, efficiency considerations. Techniques for algebraic problems, some lower bounds on parallel computations.

#### **Section-D**

NP Hard and NP Complete Problems: Basic concepts, Cook's theorem, NP hard graph and NP scheduling problems some simplified NP hard problems.

**TEXT BOOKS:**

1. Fundamental of Computer algorithms, Ellis Horowitz and Sartaj Sahni,1978, Galgotia Publ.,
2. Introduction To Algorithms, Thomas H Cormen, Charles E Leiserson And Ronald L Rivest: 1990, TMH

**REFERENCE BOOKS:**

1. The Design and Analysis of Computer Algorithm, Aho A.V. Hopcroft J.E., 1974, Addison Wesley.
2. Algorithms-The Construction, Proof and Analysis of Programs, Berlion, P.Bizard, P., 1986. Johan Wiley & Sons,
3. Writing Efficient Programs, Bentley, J.L., PHI
4. Introduction to Design and Analysis of Algorithm, Goodman, S.E. & Hedetnieni, 1997, MGH.
5. Introduction to Computers Science- An algorithms approach , Jean Paul Trembley, Richard B.Bunt, 2002, T.M.H.
6. Fundamentals of Algorithms: The Art of Computer Programming Voll, Knuth, D.E.:1985, Naresh Publ.



## **IT-303-F      SYSTEMS PROGRAMMING & SYSTEM ADMINISTRATION**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### **Section-A**

Evolution of Components Systems Programming, Assemblers, Loaders, Linkers, Macros, Compilers. Software tools, Text editors, Interpreters and program generators, Debug Monitors, Programming environment.

Compiler: Brief overview of compilation process, Incremental compiler, Assembler: Problem statement, single phase and two phase assembler, symbol table; Loader schemes, compile and go Loader, general loader schemes, absolute loader, Subroutine linkage, Reallocating loader, Direct linkage Loader, Binders, Linking loader, overlays.

### **Section-B**

Macro language and macro-processor, macro instructions, features of macro facility, macro instruction arguments, conditional macro expansion, macro calls with macro instruction defining macros.

Theoretical Concept of UNIX Operating System: Basic features of operating system; File structure: CPU scheduling; Memory management: swapping, demand paging; file system: block and fragments, inodes, directory structure; User to user communication.

### **Section-C**

Getting Started with Unix: User names and groups, logging in; Format of Unix commands; Changing your password; Characters with special meaning; Unix documentation; Files and directories; Current directory, looking at the directory contents, absolute and relative pathnames, some Unix directories and files; Looking at the file contents; File permissions; basic operation on files; changing permission modes; Standard files, standard output; Standard input, standard error; filters and pipelines; Processes; finding out about processes; Stopping background process; Unix editor vi.

Test Manipulation: Inspecting files; File statistics; Searching for patterns; Comparing files; Operating on files; Printing files; Rearranging files; Sorting files; Splitting files; Translating characters; AWK utility.

#### **Section-D**

Shell Programming: Programming in the Bourne and C-Shell; Wild cards; Simple shell programs; Shell variables; Shell programming constructs; interactive shell scripts; Advanced features.

System Administration: Definition of system administration; Booting the system; Maintaining user accounts; File systems and special files; Backups and restoration; Role and functions of a system manager. Overview of the linux operating system

#### **TEXT BOOKS:**

1. Systems Programming by Donovan, TMH.
2. The UNIX programming environment by Brian Kernighen & Rob Pike, 1984, PHI & Rob Pike.
3. Design of the UNIX operating system by Maurich Bach, 1986, PHI.
4. Introduction to UNIX and LINUX by John Muster, 2003, TMH.

#### **REFERENCE BOOK:**

1. Advanced Unix programmer's Guide by Stephen Prato, BPB
2. Unix- Concept and applications by Sumitabha Das, 2002, T.M.H

**IT-305-F**

**COMPUTER NETWORKS**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

**Section-A**

OSI Reference Model and Network Architecture: Introduction to Computer Networks, Example networks ARPANET, Internet, Private Networks, Network Topologies: Bus-, Star-, Ring-, Hybrid -, Tree -, Complete -, Irregular –Topology; Types of Networks : Local Area Networks, Metropolitan Area Networks, Wide Area Networks; Layering architecture of networks, OSI model, Functions of each layer, Services and Protocols of each layer

**Section-B**

TCP/IP: Introduction, History of TCP/IP, Layers of TCP/IP, Protocols, Internet Protocol, Transmission Control Protocol , User Datagram Protocol, IP Addressing, IP address classes, Subnet Addressing, Internet Control Protocols, ARP, RARP, ICMP, Application Layer, Domain Name System, Email – SMTP, POP,IMAP; FTP, NNTP, HTTP, Overview of IP version 6.

**Section-C**

Local Area Networks: Introduction to LANs, Features of LANs, Components of LANs, Usage of LANs, LAN Standards, IEEE 802 standards, Channel Access Methods, Aloha, CSMA, CSMA/CD, Token Passing, Ethernet, Layer 2 & 3 switching, Fast Ethernet and Gigabit Ethernet, Token Ring, LAN interconnecting devices: Hubs, Switches, Bridges, Routers, Gateways.

Wide Area Networks: Introduction of WANs, Routing, Congestion Control, WAN Technologies, Distributed Queue Dual Bus (DQDB), Synchronous Digital Hierarchy (SDH)/ Synchronous Optical Network (SONET), Asynchronous Transfer Mode (ATM), Frame Relay .Wireless Links.

**Section-D**

Introduction to Network Management: Remote Monitoring Techniques: Polling, Traps, Performance Management, Class of Service, Quality of Service, Security management,

Firewalls, VLANs, Proxy Servers, Introduction to Network Operating Systems: Client-Server infrastructure, Windows NT/2000.

**TEXT BOOKS:**

1. Computer Networks (3rd edition), Tanenbaum Andrew S., International edition, 1996.

**REFERENCE BOOKS:**

1. Data Communications, Computer Networks and Open Systems (4th edition), Halsall Fred, 2000, Addison Wesley, Low Price Edition.
2. Business Data Communications, Fitzgerald Jerry.
3. Computer Networks – A System Approach, Larry L. Peterson & Bruce S. Davie, 2<sup>nd</sup> Edition
4. Computer Networking – ED Tittel , 2002, T.M.H.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### **Section-A**

**INTRODUCTION TO WIRELESS COMMUNICATION SYSTEMS:** Evolution of mobile radio communications, examples of wireless comm. systems, paging systems, Cordless telephone systems, comparison of various wireless systems.

**MODERN WIRELESS COMMUNICATION SYSTEMS:** Second generation cellular networks, third generation wireless networks, wireless in local loop, wireless local area networks, Blue tooth and Personal Area networks.

#### **Section-B**

**INTRODUCTION TO CELLULAR MOBILE SYSTEMS:** Spectrum Allocation, basic Cellular Systems, performance Criteria, Operation of cellular systems, analog cellular systems, digital Cellular Systems.

**CELLULAR SYSTEM DESIGN FUNDAMENTALS:** Frequency Reuse, channel assignment strategies, handoff Strategies, Interference and system capacity, tracking and grade off service, improving coverage and capacity.

#### **Section-C**

**MULTIPLE ACCESS TECHNIQUES FOR WIRELESS COMMUNICATION:** Introduction to Multiple Access, FDMA, TDMA, Spread Spectrum multiple Access, space division multiple access, packet ratio, capacity of a cellular systems.

**WIRELESS NETWORKING:** Difference between wireless and fixed telephone networks, development of wireless networks, fixed network transmission hierarchy, traffic routing in wireless networks, wireless data services, common channel signaling, ISDN (Integrated Services digital Networks), advanced intelligent networks.

### **Section-D**

**INTELLIGENT CELL CONCEPT AND APPLICATION:** Intelligent cell concept, applications of intelligent micro-cell Systems, in-Building Communication, CDMA cellular Radio Networks.

#### **TEXT BOOKS:**

1. Wireless Communications: Theodore S. Rappaport; Pearsons.
2. Mobile Cellular Telecommunication: W.C.Y.Lee; McGraw Hill

#### **REFERENCE BOOK:**

1. Mobile Communications: Jochen Schiller; Pearson

L T P  
0 0 3

Class Work Marks: 25  
Exam Marks: 25  
Total Marks: 50  
Duration of exam: 3 hrs.

1. Study of PROLOG.

Write the following programs using PROLOG.

2. Write a program to solve 8 queens problem.
3. Solve any problem using depth first search.
4. Solve any problem using best first search.
5. Solve 8-puzzle problem using best first search
6. Solve Robot (traversal) problem using means End Analysis.
7. Solve traveling salesman problem.

**Note: At least 5 to 10 more exercises to be given by the teacher concerned.**

**CSIT-301-F****UNIX LAB**

L T P  
0 0 3

Class Work Marks: 50  
Exam Marks: 50  
Total Marks: 100  
Duration of exam: 3 hrs

- Study of WINDOWS 2000 Operating System.  
Study of LINUX Operating System.
- Study of UNIX Operating System (Linux kernel, shell, basic commands pipe & filter commands).
- Administration of UNIX Operating System.
- Writing of Shell Scripts (Shell programming).  
AWK programming.

**Note: At least 10 programs**



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

**SEMESTER-VII**  
**'F' Scheme effective from 2016-17**

S No	Course No.	Course Title	Teaching Schedule				Marks For Class Work	Marks for Examination		Total Marks	Duration of Exam
			L	T	P	Total		Theory	Practical		
1	CSE-401-F	Advanced Computer Architecture	3	1	-	4	50	100	-	150	3
2	CSE-405-F	Compiler Design	3	1	-	4	50	100	-	150	3
3	CSE-407-F	Neural Networks	3	1	-	4	50	100	-	150	3
4	IT-401-F	Data Warehousing & Data Mining	3	1	-	4	50	100	-	150	3
5		<b>*Elective</b>	3	1	-	4	50	100	-	150	3
6	IT-403-F	System & Network Administration	3	1	-	4	50	100	-	150	3
7	CSE-409-F	Visual Programming Lab	-	-	3	3	50	-	50	100	3
8	CSE-411-F	Compiler Design Lab	-	-	3	3	50	-	50	100	3
9	IT-407-F	System & Network Administration Lab	-	-	3	3	50	-	50	100	3
10	CSE-315-F	Practical Training-II	-	-	2	2	-	-	-	-	-
11	GFCSE-402-F	General Fitness for the Profession	-	-	-	-	-	-	50	50	3
		<b>TOTAL</b>	<b>18</b>	<b>6</b>	<b>11</b>	<b>35</b>	<b>450</b>	<b>600</b>	<b>200</b>	<b>1250</b>	

**NOTE:**

1. Students will be allowed to use non-programmable scientific calculator. However, sharing of calculator will not be permitted in the examination.
2. \*Student will be permitted to opt for any one elective run by the other departments. However, the departments will offer only those electives for which they have expertise. The choice of the students for any elective shall not be a binding for the department to offer, if the department does not have expertise.
3. A team consisting of Principal/Director, HOD of concerned department and external examiner appointed by University shall carry out the evaluation of the student for his/her General Fitness for the Profession.

**\*List of Electives:**

1. PHY-451-F NANO Technology
2. HUM-457-F Business Communication
3. CSIT-404 Parallel Computation & Applications
4. CSE-432-F Digital Image Processing
5. CSE-403-F Software Project Management
6. CSIT-401-F Mobile Computing
7. CSIT-402-F Cyber Crime Investigation & Cyber Forensics
8. IT-471-F Management Information System
9. CH-453-F Pollution & Control

**CSE-401-F**

**ADVANCED COMPUTER ARCHITECTURE**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

**Section-A**

Architecture And Machines: Some definition and terms, interpretation and microprogramming. The instruction set, Basic data types, Instructions, Addressing and Memory. Virtual to real mapping. Basic Instruction Timing.

Time, Area and Instruction Sets: Time, cost-area, technology state of the Art, The Economics of a processor project: A study, Instruction sets, Professor Evaluation Matrix

**Section-B**

Cache Memory Notion: Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the T-cycle in V-R Translation, studies. Design summary.

**Section-C**

Memory System Design: The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed queue models, waiting time, performance, and buffer size, review and selection of queuing models, processors with cache.

**Section-D**

Concurrent Processors: Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors. Shared Memory Multiprocessors: Basic issues, partitioning, synchronization and coherency, Type of shared Memory multiprocessors, Memory Coherence in shared Memory Multiprocessors.

**TEXT BOOKS:**

1. Advance computer architecture by Hwang & Briggs, 1993, TMH.
2. Pipelined and Parallel processor design by Michael J. Flynn – 1995, Narosa.

**CSE-405-F**

**COMPILER DESIGN**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

**Section-A**

Introduction to Compilers: Compilers and translators need of translators, structure of compiler: its different phases, Compiler construction tools.

Lexical Analysis: Role of lexical analyzer, design of lexical analyzer, regular expressions, Specification and recognition of tokens, input buffering, A language specifying lexical analyzer. Finite automata, conversion from regular expression to finite automata, and vice versa, minimizing number of states of DFA, Implementation of lexical analyzer.

**Section-B**

Syntax Analysis: Role of parsers, context free grammars, definition of parsing.

Parsing Technique: Shift- reduce parsing, operator precedence parsing, top down parsing, predictive parsing.

LR parsers, SLR, LALR and Canonical LR parser.

**Section-C**

Syntax Directed Translations: Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation, three address code, quadruples and triples.

Symbol Table & Error Detection and Recovery: Symbol tables, its contents and data structure for symbol tables; trees, arrays, linked lists, hash tables. Errors, lexical phase error, syntactic phase error, semantic error.

**Section-D**

Code Optimization & Code Generation: Code generation, forms of objects code, machine dependent code, optimization, register allocation for temporary and user defined variables.

**TEXT BOOKS:**

1. Compilers Principle, Techniques & Tools - Alfred V. AHO, Ravi Sethi & J.D. Ullman; - 1998 Addison Wesley.
2. Compiler Design by O.G. Kakde, 1995, Laxmi Publ.

**REFERENCE BOOKS:**

1. Theory and practice of compiler writing, Tremblay & Sorenson, 1985, Mc. Graw Hill.
2. System software by Dhamdare, 1986, MGH.
3. Principles of compiler Design, Narosa Publication

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section-A

Overview of biological neurons: Structure of biological neurons relevant to ANNs.

Fundamental concepts of Artificial Neural Networks: Models of ANNs; Feedforward & feedback networks; learning rules; Hebbian learning rule, perception learning rule, delta learning rule, Widrow-Hoff learning rule, correction learning rule, Winner-take-all learning rule, etc.

### Section-B

Single layer Perception Classifier: Classification model, Features & Decision regions; training & classification using discrete perceptron, algorithm, single layer continuous perceptron networks for linearly separable classifications.

### Section-C

Multi-layer Feed forward Networks: linearly non-separable pattern classification, Delta learning rule for multi-perceptron layer, generalized delta learning rule, Error back propagation training, learning factors, Examples.

Single layer feed back Networks: Basic Concepts, Hopfield networks, Training & Examples.

### Section-D

Associative memories: Linear Association, Basic Concepts of recurrent Auto associative memory: retrieval algorithm, storage algorithm; by directional associative memory, Architecture, Association encoding & decoding, Stability.

Self organizing networks: UN supervised learning of clusters, winner-take-all learning, recall mode, Initialization of weights, separability limitations

**TEXT BOOK:**

1. Introduction to Artificial Neural systems by Jacek M. Zurada, 1994, Jaico Publ. House.

**REFERENCE BOOKS:**

1. "Neural Networks: A Comprehensive formulation", Simon Haykin, 1998, AW
2. "Neural Networks", Kosko, 1992, PHI.
3. "Neural Network Fundamentals" – N.K. Bose, P. Liang, 2002, T.M.H

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### **Section A**

Data warehousing Definition, usage and trends. DBMS vs data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations.

Data warehouse process & architecture, OLTP vs OLAP, ROLAP vs MOLAP, types of OLAP, servers, 3-Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

### **Section B**

Data warehouse implementation, computation of data cubes, modelling OLAP data, OLAP queries manager, data warehouse back end tools, complex aggregation at multiple granularities, tuning and testing of data warehouse.

### **Section C**

Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications.

Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualisation specification, data mining languages and standardisation of data mining.

### **Section D**

Data mining techniques: Association rules, Clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, Support Vector Machines and Fuzzy techniques.

Mining complex data objects, Spatial databases, Multimedia databases, Time series and Sequence data; mining Text Databases and mining Word Wide Web.

### **Text Books:**

- 1.Data Warehousing In the Real World; Sam Anahory & Dennis Murray; 1997, Pearson



2. Data Mining- Concepts & Techniques; Jiawei Han & Micheline Kamber- 2001, Morgan Kaufmann.
- 3.Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderabad.

**Reference Books:**

1. Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson,
2. Data Warehousing, Data Mining and OLTP; Alex Berson, 1997, Mc Graw Hill. Data warehousing System; Mallach; 2000, Mc Graw Hill.
3. Building the Data Warehouse; W.H. Inman, 1996, John Wiley & Sons.
4. Developing the Data Warehouses; W.H. Inman, C. Kelly, John Wiley & Sons. Managing the Data Warehouses; W.H. Inman, C.L. Gasey, John Wiley & Sons. .

**IT-403-F**

**SYSTEMS & NETWORK ADMINISTRATION**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

**Section A**

Introduction to Systems and Network Administration: The Scope of Systems and Network Administration, The Goals of Systems and Network Administration, System Components and their Management: Operating Systems: Windows and Unix Variants, File Systems and Standards (UFS, NFS, NTFS), Processes and Job Control, Privileged, User and Group Accounts, Logs and Audits, Systems Performance Tuning:

**Section B**

Host Management: Booting and Shutting down of an Operating System, Formatting, Partitioning and Building a File System, File System Layout, Concept of swap space, Cloning Systems, OS Installation, Installation and configuration of devices and drivers, Software Installation and Structuring Software, Open Source Software: The GNU Project, Superuser/Administrator Privileges, User Management, Adding/Removing users, Controlling User Resources, Disk Space Allocation and quotas, Process Management and Monitoring, Scheduling Processes, Killing/Stopping processes, Restarting a Process, Monitoring Process Activity, Maintaining Log Files, File System Repair, Backup and Restoration, , Handling Man Pages/Help System, Kernel Customization, Integrating Multiple Operating Systems, System Sharing, User IDs, Passwords and Authentication.

**Section C**

Network Administration: Introduction to Network Administration Approaches, Addressing and Subnetting : Fixed Vs Variable Masks, VLAN Principles and Configuration, Routing Concepts, Static and Dynamic Routing, Routing Protocols: RIP, OSPF, BGP, Network Address Translation (NAT), Configuring a Linux/Windows Box as a Router, Dial-up configuration and Authentication: PPP, Radius, RAS, Configuring a DNS Server, Configuring Sendmail Service, Configuring a Web Server, Configuring a Proxy Server, TCP/IP Troubleshooting: ping, traceroute, ifconfig, netstat, ipconfig, Network Management.

**Section D**

Host and Network Security: Security Planning, Categories of Security: C1, C2, C3, C4, Password

Security, Access Control and Monitoring: Wrappers, Firewalls: Filtering Rules, Detection and Prevention of Denial of Service (DOS) Attacks, Automatic Identification of Configuration Loop Holes, Security Information Resources: CERT, Installing and Upgrading System Software, Use of Scripting tools: Shell Scripting, Perl/Python Scripting, Use of Make Option  
Security Planning, Categories of Security: C1, C2, C3, C4, password security, Access Control and Monitoring.

**Text Books:**

1. "Principles of Network and System Administration", Mark Burgess, 2000, John Wiley and Sons Ltd,
2. "TCP/IP Network Administration" (3<sup>rd</sup> Edition), Craig Hunt, O'Reilly and Associates Inc., 2002.
3. "Windows 2000 Administration", George Splading, 2000, McGraw-Hill.
4. "Linux Network Administrator's Guide", Olaf Kirch and Terry Dawson, (2<sup>nd</sup> Edition), O'Reilly and Associates Inc., 2000, (Shroff Publishers and Distributors, Calcutta)

**Software Requirements: Microsoft Windows 2000, Linux, Perl/Python**

L T P  
0 0 3Class Work Marks: 50  
Exam Marks: 50  
Total Marks: 100  
Duration of exam: 3 hrs**Study of Visual Basic 6.0 .NET and Visual C++ 6.0 .NET.**

- 1) Study Windows API's. Find out their relationship with MFC classes. Appreciate how they are helpful in finding complexities of windows programming.
- 2) Get familiar with essential classes in a typical (Document- view architecture) VC++ Program and their relationship with each other.
- 3) Create an SDI application in VC++ that adds a popup menu to your application which uses File drop down menu attached with the menu bar as the pop-up menu. The pop-up menu should be displayed on the right click of the mouse.
- 4) Create an SDI application in VC++ using which the user can draw atmost 20 rectangles in the client area. All the rectangles that are drawn should remain visible on the screen even if the window is refreshed. Rectangle should be drawn on the second click of the left mouse button out of the two consecutive clicks. If the user tries to draw more than 20 rectangles, a message should get displayed in the client area that "No more rectangles can be drawn"
- 5) Create an application in VC++ that shows how menu items can be grayed, disabled and appended at run time.
- 6) Write a program in VC++ to implement serialization of inbuilt and user defined objects.
- 7) Write a program in VC++ to create archive class object from C File class that reads and stores a simple structure (record).
- 8) Make an Active X control in VC++ derived from a standard control.
- 9) Write a program in VB to implement a simple calculator.
- 10) Create a simple database in MS Access Database /Oracle and a simple database application in VB that shows database connectivity through DAO and ADO.
- 11) Write a simple program that displays an appropriate message when the illegal operation is performed using error handling technique in VB.
- 12) Write a program in VB to create a notepad.
- 13) Create a DLL in VB.

**Bright students may do the following exercises:**

- 14) Write a program in VC++ to implement a simple calculator.
- 15) Write a program in VC++ to create a static link library and a dynamic link library.
- 16) Create a simple database in MS Access Database and a simple database application in VC++ that shows database connectivity through ADO model.
- 17) Make an Active X control of your own using VB.
- 18) With the help of VB, create an object of excel application and implement any action on it.

L T P  
0 0 3

Class Work Marks: 50  
Exam Marks: 50  
Total Marks: 100  
Duration of exam: 3 hrs.

1. Practice of LEX/YACC of compiler writing.
2. Write a program to check whether a string belong to the grammar or not.
3. Write a program to generate a parse tree.
4. Write a program to find leading terminals.
5. Write a program to find trailing terminals.
6. Write a program to compute FIRST of non-terminal.
7. Write a program to compute FOLLOW of non-terminal.
8. Write a program to check whether a grammar is left Recursion and remove left Recursion.
9. Write a program to remove left factoring.
10. Write a program to check whether a grammar is operator precedent.
11. To show all the operations of a stack.
12. To show various operations i.e. red, write and modify in a text file.

**Note : At least 10 programs are required to be developed in the semester.**

L T P  
0 0 3

Class Work Marks: 50  
Exam Marks: 50  
Total Marks: 100  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

- Management of the users & the domain.
- Configuring DHCP.
- Setting up the local security policy.
- Start and stop services from user window and command prompt.
- Use of event viewer.
- Use of the performance monitor.
- Management of the IIS and FJP server.
- Setting up of local area network.
- Setting up of router in Window 2000 server.
- Use of utilities (a) Ping (b) Trocert (c) netstat (d) net  
(e) IP configuration (f) Path ping
  
- Use of network monitor.
- Setting up of a DNS.
- Setting up and use “Terminal Clinet Services”.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### Section A

**Introduction to Nanotech:** Crystalline-Non crystalline materials, Fundamental of Nanotechnology and Nanomaterials in Metals, other Materials, & Biosystem, Molecular Recognition, Quantum Mechanics and Quantum Ideas in Nanotechnology. Semiconductor Nanoparticles.

#### Section B

**Preparation and Characterization of Nanoparticles:** Nanoscale Lithography, Dip Pen Lithography, E-Beam Lithography, Nanosphere Life off, Lithography; Molecular Synthesis, Nanoscale Crystal Growth, Polymerization Nanobricks and Building blocks: Tools for Measuring Nanostructures-Scanning Prob Instrument, Spectroscopy, Electrochemistry, Election Microscope Tools to Make Nanostructure.

#### Section C

**Properties & Application of Nano Crystalline Materials:** Application in Sensors, Nanoscale Biostructure Electronics, Magnets, optics, Fabrication Biomedical Applications, Smart Materials-Self Healing Structures, Heterogenous Nanostructure and composites En capsulation, Carbon Nanotubes.

#### Section D

Synthesis of semiconductor Nanoclusters, Processing of Nanomaterials Nanobusiness-Boom, Bust and Nano Tech. NanoEthics

#### Text Books:

1. Camarata, R.C. Nanomaterials synthesis, properties and application Institute of Physics Publication.
2. Madou, Fundamentals of microfabrication, Mcgraw Hill.
3. Sibelia, J.P., A Guide to Material characterization, Prentice Hall.
4. Mark Ratner, Daniel Ratner-Nano Technology-A Gentle Introduction to the next big idea.

**HUM-457-F**

**BUSINESS COMMUNICATION**

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

The course proposes to help students develop business and technical communication competence. It focuses on writing skills and strategies for specific purposes. The inevitability of introducing this course to Engineering students is embodied in that it has comparatively a high concentration of certain complex writing techniques and procedures.

**Section A**

**Business Correspondence :** Characteristics and formats of Business letter; Quotations, Orders, Tenders, Sales letters, claim and adjustment letters, Credit and Collection letters, Application Letters for vacant situations with emphasis on Resumes and Curriculum Vitae; E-mail and Netiquette-format, style and tone.

**Section B**

**Business Reports and Proposals :** Importance, Function, Pattern and formats of Reports, Typical Business Reports, Report Organisation and Presentation, and Formal Reports; Proposal Formats, Writing problem-Solving proposals, Executive Summary Proposals and project Proposals.

**Section C**

**Meetings :** Writing of Memorandum, Notes, Agenda and minutes of Meeting.

**Section D**

**Public Relations and Advertising Documents:** Press Releases, Public Service announcements, Advertising Strategy and its objective, Designing of Classified and Display Advertising copies.



**Text Book:**

1. Business Communication: Process & Product by Hary Ellen Guffey, IV Edition, South-Western College Publishing, Cincinnati.
2. Business Correspondence and Report Writing by R.C. Sharma & Krishna Mohan, Tata Macgraw Hill Publication, New Delhi.
3. Effective Business English and Correspondence by M.S. Ramesh and C.C. Pattanshetti, R. Chand & Co., New Delhi. 4. Effective Letters in Business by Robert by C. Shruter, Tata Macgraw Hill, New Delhi.
5. English Business Letters by F.W. Wing & D. Anncrea, Orient Longman.
6. Written Communication in English by Sarah Freeman, Orient Longman.
7. International Business English by Leo Jones & Richard Alexander, Cambridge University Press.
8. General and Business English by Sweet Stephen, Sir Issac Pitman & Sons Ltd., London.
9. How to Write and Present Technical Information, Charles H. Sides, Cambridge University Press, U.K.
10. Strategies for Engineering Communication, Susan Stevenson Steve Whitmore, John Wiley and Sons, Inc. Printed in India by Replika Press. Pvt. Ltd., Delhi.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### Section-A

**Introduction to Parallel Processing:** Criteria for judging the architecture, Architectural classification schemes, Trends towards parallel processing, Parallelism in uni processor systems, Parallel Computer Structure, Applications of parallel processing Principles of Pipelining - Principles of Linear and non-linear pipelining, classification of pipeline processors, general pipelines and reservation tables, Interleaved memory organization .

#### Section-B

**Structures and algorithms for Array Processors:** SIMD array processors: SIMD computer organization, Masking and data routing mechanisms, SIMD interconnection networks: static v/s dynamic, mesh connected ILLIAC network, Barrel Shifter network, Shuffle-exchange and omega network.

#### Section-C

**Multiprocessor Architecture:** Functional structures, UMA & NUMA multiprocessors. Interconnection Networks: Time shared or common buses, Bus arbitration algorithm, Cross bar switch and multiport memories, Comparison of multiprocessor interconnection structure, multistage networks for multiprocessors, Algorithm Analysis – Mathematical background, what to analyze, Running time calculation, Logarithms in Running time

#### Section-D

**Algorithm design techniques:** Greedy algorithms, Simple Scheduling algorithms, Multiprocessor case, Huffman code analysis, Bin packing algorithms, Back tracking algorithms, Turnpike reconstruction algorithm Parallel processing terminology - Speed up, scaled speed up and parallelizability.

**Elementary parallel algorithms:** Hypercube SIMD model, Shuffle-exchange SIMD model, 2-D mesh SIMD, UMA multiprocessor, Broadcast Matrix multiplication - Algorithms for Processor arrays, Algorithms for multiprocessors and multicomputers. Sorting - Lower bounds on parallel sorting, Odd-Even transposition sort.

#### TEXT BOOKS:

1. Kai Hwang and Faye A. Briggs, Computer Architecture and Parallel Processing McGraw Hill Series.
2. Kai Hwang, Advanced Computer Architecture, Parallelism, Scalability, Programmability.

3. Michael J. Quinn, *Parallel Computing – Theory and Practice* – TMH Publication.
4. Mark Allen Weiss, *Data Structures and Algorithm Analysis in C*, Benjamin/Cummings Publication.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### **Section-A**

Introduction and Fundamental to Digital Image Processing: What is Digital Image Processing, Origin of Digital Image Processing, Examples that use Digital Image Processing, Fundamental steps in Digital Image Processing, Components of Digital Image Processing System, Image sensing and acquisition, Image sampling, quantization and representation, Basic relationship between pixels.

#### **Section-B**

Image Enhancement in the Spatial Domain & Frequency domain: Background, Basic gray level transformation, Histogram processing, Basics of spatial filtering, Smoothing and Sharpening Spatial filters, Introduction to Fourier Transform and the Frequency Domain, Discrete Fourier Transform. Smoothing and Sharpening Frequency-Domain filters.

Image Restoration: Image Degradation/Restoration Process, Noise models, Restoration in presence of noise, Inverse Filtering, Minimum Mean Square Filtering, Geometric mean filter, Geometric transformations.

#### **Section-C**

Color Image Processing: Color Fundamentals, Color models, Basis of full color image processing, Color transformations.

Image Compression: Fundamentals, Image compression models, Error free compression, Lossy compression.

Image Segmentation: Detection of Discontinuities, Edge linking and boundary detection, Thresholding, Region oriented segmentation.

#### **Section-D**

Representation, Description and Recognition: Representation-chain codes, polygonal approximation and skeletons, Boundary descriptors-simple descriptors, shape numbers, Regional descriptors- simple, topological descriptors, Pattern and Pattern classes-Recognition based on matching techniques.

Recognition: Pattern and pattern Classes, Decision-Theoretic Methods.

#### **TEXT BOOK:**

1. Digital Image Processing by Rafael C. Gonzalez & Richard E. Woods –2002, Pearson Education.

#### **REFERENCE BOOK:**

1. Digital Image Processing by A.K. Jain, 1995,-PHI

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section-A

Introduction to Software Project Management (SPM): Definition of a Software Project (SP), SP Vs. other types of projects activities covered by SPM, categorizing SPs, project as a system, management control, requirement specification, information and control in organization.

Stepwise Project planning: Introduction, selecting a project, identifying project scope and objectives, identifying project infrastructure, analyzing project characteristics, identifying project products and activities, estimate efforts each activity, identifying activity risk, allocate resources, review/ publicize plan.

### Section-B

Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit evaluation techniques, risk evaluation. Selection of an appropriate project report; Choosing technologies, choice of process model, structured methods, rapid application development, water fall, V-process, spiral models. Prototyping, delivery. Albrecht function point analysis.

Activity planning & Risk Management: Objectives of activity planning, project schedule, projects and activities, sequencing and scheduling activities, network planning model, representation of lagged activities, adding the time dimension, backward and forward pass, identifying critical path, activity throat, shortening project , precedence networks.

Risk Management: Introduction, the nature of risk, managing risk, risk identification, risk analysis, reducing the risks, evaluating risks to the schedule, calculating the z values..

### Section-C

Resource allocation &Monitoring the control: Introduction, the nature of resources, identifying resource requirements, scheduling resources creating critical paths, counting the cost, being specific, publishing the resource schedule, cost schedules, the scheduling sequence.

Monitoring the control: Introduction, creating the frame work, collecting the data, visualizing progress, cost monitoring, earned value, prioritizing monitoring, getting the project back to target, change control.

Managing contracts and people: Introduction, types of contract, stages in contract, placement, typical terms of a contract, contract management, acceptance, Managing people and organizing terms: Introduction, understanding behavior,

### **Section-D**

Organizational behavior: a back ground, selecting the right person for the job, instruction in the best methods, motivation, working in groups, becoming a team, decision making, leadership, organizational structures, conclusion, further exercises.

Software quality: Introduction, the place of software quality in project planning, the importance of software quality, defining software quality, ISO 9126, Practical software quality measures, product versus process quality management, external standards, techniques to help enhance software quality.

Study of Any Software Project Management software: viz Project 2000 or equivalent

#### **TEXT BOOK:**

1. Software Project Management (2<sup>nd</sup> Edition), by Bob Hughes and Mike Cotterell, 1999, TMH.

#### **REFERENCE BOOKS:**

1. Software Engineering – A Practitioner’s approach, Roger S. Pressman (5<sup>th</sup> ed), 2001, MGH
2. Software Project Management, Walker Royce, 1998, Addison Wesley.
3. Project Management 2/c. Maylor
4. Managing Global software Projects, Ramesh, 2001, TMH.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### Section-A

**Introduction:** Wireless communication, Wireless data technologies, Frequencies for radio signals, antennas and signal propagation, need and types of multiplexing techniques, modulation types, use of spread spectrum, cellular systems.

**Medium Access Control:** Need for MAC algorithm, medium access methods and comparison of these methods.

#### Section-B

**Digital mobile Phone Systems:** GSM: mobile services, system architecture, radio interference, protocols, localization and calling, hand over, security, new data services, other digital cellular networks, comparison with GSM.

#### Section-C

**Wireless LAN:** Introduction, advantages and design goals for wireless LAN, Infrastructure, ad-hoc networks, IEEE 802.11: system and protocol architecture, physical layer, HIPERLAN protocol architecture and physical layer and MAC, Blue tooth physical and MAC layer. Wireless ad-hoc networks.

**Protocols for mobile computing:** Mobile network layer, mobile IP, Snooping TCP, Mobile TCP, Fast and selective retransmission and recovery, Transaction oriented TCP.

#### Section-D

**Wireless Application Protocol:** WAP architecture wireless datagram protocol, transport layer security, WML, script.

**Palm OS:** - Architecture, features of kernel, memory, system managers, Symbian OS: Architecture, hardware interface, memory, management, Window CE: features and architecture.

#### TEXT BOOKS:

1. Mobile Communications – Jachen Schiller (Addison- Wesley)
2. Mobile Computing – Asoke K Talukder, Roopa R Yavgal, (TMH Publishing)

## CSIT-402-F CYBER CRIME INVESTIGATIONS AND CYBER FORENSICS

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section A

**Introduction :** Review of TCP/IP and TCP, IP Header analysis, Introduction to Cyber World, Cyber attacks and cyber security, Information warfare and cyber terrorism, Types of cyber attacks, Cyber Crime and Digital Fraud, Overview of Types of computer forensics i.e. Media Forensics, Network forensics (internet forensics), Machine forensics, Email forensic (e-mail tracing and investigations)

### Section B

**Live Data collection and investigating windows environment:** windows Registry analysis, Gathering Tools to create a response toolkit (Built in tools like netstat, cmd.exe, nbtstat, arp, md5sum, regdmp etc and tools available as freeware like Fport, Pslist etc), Obtaining volatile Data (tools like coffee, Helix can be used) Computer forensics in windows environment, Log analysis and event viewer, File auditing, identifying rogue machines, hidden files and unauthorized access points

### Section C

**Live Data collection and investigating Unix/Linux environment:** /Proc file system overview, Gathering Tools to create a response toolkit (Built in tools like losetup, Vnode, netstat, df, md5sum, strace etc and tools available as freeware like Encase, Carbonite etc)

Handling Investigations in Unix/Linux Environment: Log Analysis (Network, host, user logging details), Recording incident time/date stamps, Identifying rogue processes, unauthorized access points, unauthorized user/group accounts,

### Section D

**Forensic tools and report generation:** Recovery of Deleted files in windows and UNIX, Analyzing network traffic, sniffers, Ethical Hacking, Hardware forensic tools like Port scanning and vulnerability assessment tools like Nmap, Netscan etc. Password recovery (tools like John the ripper, L0phtcrack, and THC-Hydra), Mobile forensic tools and analysis of called data record Template for computer forensic reports



**TEXT BOOKS:**

1. Incident Response & Computer Forensics. Mandia, k., Prorise, c., Pepe, m. 2<sup>nd</sup> edition. Tata-McGraw Hill, 2003.
2. Guide to Computer Forensics and Investigations, 2nd edition, Bill Nelson, Amelia Phillips, Frank Enfinger, and Chris Steuart , Thomson Learning.

**REFERENCE BOOKS:**

1. Digital Evidence and Computer Crime, 2nd Edition , Eoghan Casey , academic Press File System Forensic Analysis by Brian Carrier, addition Wesley.
2. Windows Forensic Analysis DVD Toolkit (Book with DVD-ROM), Harlan Carvey, syngress Publication.
3. EnCE: The Official EnCase Certified Examiner Study Guide, 2nd Edition, Steve Bunting, sybex Publication.

L T P  
3 1 0

Class Work Marks: 50  
Exam Marks: 100  
Total Marks: 150  
Duration of Exam: 3 Hrs.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

### Section A

**Foundation of Information System :** Introduction to Information System and MIS, Decision support and decision making systems, systems approach, the systems view of business, MIS organization within company, Management information and the systems approach.

### Section B

**Conceptual system design:** Define the problems, set systems objects, establish system constraints, determine information needs determine information sources, develop alternative conceptual design and select one document the system concept, prepare the conceptual design report.

**Detailed system design:** Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade of criteria, define the sub systems, sketch the detailed operating sub systems and information flow, determine the degree of automation of each operation, inputs outputs and processing, early system testing, software, hardware and tools propose an organization to operate the system, document the detailed design revisit the manager user.

### Section C

**Implementation evaluation and maintenance of the MIS :** Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information dissemination, develop the files test the system cut-over, document the system, evaluate the MIS control and maintain the system. Pitfalls in MIS development.

### Section D

**Information Technology:** Computer hardware & software, DBMS, RDBMS and Telecommunication.

**Advanced Concepts in Information Systems:** Enterprise Resources Management (ERP), Supply Chain Management, CRM, Procurement Management System.

**Text Books:**

- Management Information System by W.S. Jawadekar, 2002, Tata McGraw Hill.
- Information System for Modern Management (3rd edition)- Robert G. Murdick, Loel E. Ross & James R. Claggett. PHI.

**Reference Books:**

- Management Information System; O Brian; TMH
- Management Information System by Davis Olson Mac Graw Hill.
- Management Information System by Stalling, (Maxwell Mc Millman Publishers).
- Information System; a Management Perspective; Alter Addison Wesley.
- Introduction to Information System; McGraw Hill.

**NOTE: For setting up the question paper, question no 1 will be set up from all the four sections which will be compulsory and of short answer type. Two questions will be set from each of the four sections. The students have to attempt first common question, which is compulsory, and one question from each of the four sections. Thus students will have to attempt 5 questions out of 9 questions.**

#### Section A

**Waster Water & its treatment Processes:** Waster-water characteristics, effluent standards, primary treatment, secondary treatment-aerobic (activated sludge, aerated lagoons, trickling filter, roughing filter, rotating biological contactor) anaerobic (contact process, UASB).

#### Section B

**Air Pollution: Classification of air Pollutants Particulates:** Physical characteristics, mode of formation, setting properties, Control measures.

Hydrocarbons : Nature; sources, control Carbon

Monoxide : Source, harmful effects on human health, control measure. Oxides of Sulphur and Nitrogen Sources, effects on human health and plants. Control measure.

#### Section C

**Solid Waste :** Types, sources and properties of solid waste, solid waste management-Generation, Collection and techniques for ultimate disposal, Elementary discussion on resource and energy recovery.

#### Section D

**Nuclear Pollution:** Elementary treatment of nuclear pollution, metal pollution, noise pollution their effects & control.

#### Text Books:

1. Environmental Engg. by Howard S. Peavy & Others, MGH International.
2. Metacaf-EDDY-Waste-water engineering revised by George Teholonobus (TMH).
3. Environmental Chemistry by B.K. Sharma, Goel Publishing, Meerut.
4. Environmental Chemistry, A.K. DE, Wiley Eastern.
5. Air Pollution: H.C. Perking-McGraw Hill.

**L T P**

- - 2

At the end of Sixth semester each student would undergo six weeks Practical Training in an industry/ Professional organization / Research Laboratory with the prior approval of the Director- Principal/ Principal of the concerned college and submit a written typed report along with a certificate from the organization. The report will be evaluated during VII Semester by a Board of Examiners to be appointed by the Director- Principal/ Principal of the concerned college who will award one of the following grades:

**Excellent : A****Good : B****Satisfactory : C****Not satisfactory: F**

A student who has been awarded 'F' grade will be required to repeat the practical training.

L T P  
- - -

Class Work : -- Marks  
Practical : 50 Marks  
Total Marks : 50 Marks

At the end of semester students will be evaluated on the basis of their performance in various fields. The evaluation will be made by the panel of experts/examiners/teachers to be appointed by the Principal/Director of the College. A specimen performa indicating the weightage to each component/ activity is given below:-

Name : \_\_\_\_\_ College Roll No. \_\_\_\_\_  
Univ.Roll No. \_\_\_\_\_  
Branch \_\_\_\_\_ Year of Admission \_\_\_\_\_.

**I. Academic Performance (15 Marks):**

(a) Performance in University Examination:-

---

Sem.	Result	%age of Marks obtained	Number of Attempt in which the Sem. Exam has been cleared
I			
II			
III			
IV			
V			
VI			
VII			

---

**II. Extra Curricular Activities (10 Marks):**

Item	Level of Participation	Remarks (Position Obtained)
Indoor Games (Specify the Games)	_____ _____ _____ _____	
Outdoor Games (Specify the Games)	_____ _____ _____	
Essay Competition	_____ _____	

Scientific \_\_\_\_\_  
Technical \_\_\_\_\_  
Exhibitions \_\_\_\_\_

Debate \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Drama \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Dance \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Music \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Fine Arts \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Painting \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Hobby Club \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

N.S.S \_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Hostel Management \_\_\_\_\_  
Activities \_\_\_\_\_

Any other \_\_\_\_\_  
activity (Please \_\_\_\_\_  
Specify) \_\_\_\_\_

**III. Educational tours/visits/Membership of Professional Societies (5 Marks)**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

**IV. Contribution in NSS Social Welfare Floor Relief/draught relief/Adult Literacy mission/Literacy Mission/Blood Donation/Any other Social Service (5 Marks)**

1. \_\_\_\_\_
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_

**V. Briefly evaluate your academic & other performance & achievements in the Institution (5 Marks)**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**VI. Performance in Viva voce before the committee (10 Marks)**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**\*Marks obtained I.( )+II( )+III( )+IV( )+V( )+VI( ) =**

**\*\*Total Marks:**

Member      Member      Member      Member      Member



**M.D.UNIVERSITY, ROHTAK (HARYANA)**  
**REVISED SCHEME OF STUDIES & EXAMINATION FOR BACHELOR OF TECHNOLOGY**  
**COURSE IN**  
**COMPUTER SCIENCE & INFORMATION TECHNOLOGY**  
**SEMESTER-VIII**

**‘F’ Scheme effective from 2016-17**

S No	Course No.	Course Title	Internal Marks	External Marks	Total Marks
1	CSE-413-F	Industrial Training/Institutional project Works	150	150	300

**Note:**

The students are required to undergo Industrial Training or Institutional Project Work of duration not less than 4 months in a reputed organization or concerned institute. The students who wish to undergo industrial training, the industry chosen for undergoing the training should be at least a private limited company. The students shall submit and present the mid-term progress report at the Institute. The presentation will be attended by a committee. Alternately, the teacher may visit the Industry to get the feedback of the students.

The final viva-voce of the Industrial Training or Institutional Project Work will be conducted by an external examiner and one internal examiner appointed by the Institute. External examiner will be from the panel of examiners submitted by the concerned institute approved by the Board of Studies in Engg. & Technology. Assessment of Industrial Training or Institutional Project Work will be based on seminar, viva-voce, report and certificate of Industrial Training or Institutional project Work obtained by the student from the industry or Institute.

The internal marks distributions for the students who have undergone Industrial Training consist of 50 marks from the industry concern and 100 marks by the committee members consisting of faculty members of concerned department of the parent institute.

The teachers engaged for Institutional Project work shall have a workload of 2 hours per group (at least 4 Students) per week.