

KURUKSHETRA UNIVERSITY KURUKSHETRA
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER-III)

Scheme of Computer 3rd sem										
S. No.	Code	Subject Name	Weekly Load				Exam. Sch.			
			L	T	P/D	Tot	Th	Ses	Pr	T
1	HUM-201E	Basics of Eco. & Mgt	3	1		4	100	50		150
2	CSE-201E	D.B.M.S.	3	1		4	100	50		150
3	CSE-203E	Data Structures	3	1		4	100	50		150
4	CSE-205E	Discrete Structure	3	1		4	100	50		150
5	CSE-207E	Internet Fundamentals	3	1		4	100	50		150
6	ECE-203E	Analog Communication	3	1		4	100	50		150
7	IT-253E	Internet Lab			3	3		50	25	75
8	CSE-209E	D.B.M.S. Lab			3	3		25	25	50
9	CSE-211E	Data Structures Lab			3	3		50	25	75
10	ECE-207E	Analog Communication Lab			2	2		25	25	50
		Total	18	6	11	35	600	450	100	1150

HUM-201E : BASICS OF ECONOMICS & MANAGEMENT

L T P
3 1 --

Sessional : 50 marks
Theory : 100 marks
Total : 150 marks
Duration of Exams : 3 Hrs

Unit – I

Meaning of industrial Economic, Production function. Its types, least cost combination, law of variable proportion, law of returns, increasing constant & Diminishing.

Fixed & variable costs in short run & long run, opportunity costs, relation between AC & MC, U-shaped short run AC curve.

Price & output determination under monopoly in short run & long run, price discrimination. Price determination under discriminating Monopoly, comparison between monopoly & perfect competition.

Unit -- II

Meaning of management, characteristics of management, management Vs administration, management -- Art, Science & Profession. Fayol's principles of management, Human relation approach, Functions of management.

Unit -- III

Planning & Organizing

Planning, steps in planning, Planning premises, difference between planning policy & strategy, Authority & responsibility, centralization & decentralization.

Unit – IV

Staffing, Directing & Controlling -- Manpower planning, Recruitment & selection styles of leadership communication process and barriers, control process and steps in controlling.

Note: - Eight questions are to be set taking two from each unit. The students are required to attempt five questions in all taking at least one from each unit.

Text Books:

1. "Modern Economic Theory" Dewtt, K.K, S.S Chand & Co.
2. "Economic Analysis" K.P. Sudharam (Sultan Chand & Co.)
3. "Micro Economics Theory" M.L Jhingan (Konark Pub. Pvt. Ltd.)
4. "Principles and Practices of Management" L.M Parshad.
5. "Essentials of Management" Harold Kaontz.
6. "Organization and Management" R.D. Aggarwal, Tata McGraw Hill.

CSE-201 E

DATABASE MANAGEMENT SYSTEMS

L T P
3 1 -

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

Unit-1 Introduction Overview of database Management System; Various views of data, data Models, Schemes, Introduction to Database Languages & Environments.

Advantages of DBMS over file processing systems, Responsibility of Database Administrator, Three levels architecture of Database Systems, : Introduction to Client/Server Architecture.

Data Models: E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables, Naming Secondary Storage Devices. Network & Hierarchical Model.

Unit-2 File Organization: Sequential Files, index sequential files, direct files, Hashing, B-trees Index files, Inverted Lists.

Relational Model, Relational Algebra & various operations (set operations, select, project, join, division), Order, Relational calculus: Domain, Tuple. Well Formed Formula, Specifications, quantifiers.

Unit-3 Introduction to Query Languages: QBE, integrity constraints, functional dependencies & Normalization (Normal forms- up to 5th Normal forms).

Unit-4 Introduction to Distributed Data processing, Object Oriented Data Base Management Systems parallel Databases, data mining & data warehousing, Concurrency control: Transaction, Time stamping, Lock-based Protocols, serializability and Recovery Techniques.

Text Books:

- Database System Concepts by A. Silberschatz, H.F. Korth and S. Sudarshan, 3rd edition, 1997, McGraw-Hill, International Edition.
- Introduction to Database Management system by Bipin Desai, 1991, Galgotia Pub.

Reference Books:

- Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addison-Wesley, Low Priced Edition.
- An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.
- Database Management and Design by G.W. Hansen and J.V. Hansen, 2nd edition, 1999, Prentice-Hall of India, Eastern Economy Edition.
- Database Management Systems by A.K. Majumdar and P. Bhattacharyya, 5th edition, 1999, Tata McGraw-Hill Publishing.
- A Guide to the SQL Standard, Date, C. and Darwen, H. 3rd edition, Reading, MA: 1994, Addison-Wesley.
- Data Management & file Structure by Looms, 1989, PHI

Note: Eight questions will be set in all by the examiners taking at least two questions from each unit .Students will be required to attempt five questions in all at least one from each unit.

CSE-203 E

DATA STRUCTURES

L T P

Sessional: 50 Marks

3 1 -

Exam: 100 Marks

Total: 150 Marks

Duration of Exam: 3 Hrs.

Unit-1 Introduction: Introduction to Data Structures: Definition & abstract data types, Static and Dynamic implementations, Examples and real life applications; built in and user defined data structures, Ordered list and Operations on it.

Arrays: Definition, implementation, lower bound, upper bound, addressing an element at a particular index for one dimensional arrays, Two dimensional arrays and Multidimensional arrays. Implementation of Data Structures like structure/ Record, Union, Sparse matrices: implementation of transpose.

Stacks : Sequential implementation of stacks, operations, Polish-notations, Evaluation of postfix expression, Converting Infix expression to Prefix and Postfix expression, Applications.

Unit-2 Queues: Definition, Sequential implementation of linear queues, Operations. Circular queue: implementation (using arrays), Advantage over linear queue, Priority queues & Applications.

Linked Lists: Need of dynamic data structures, continuous & linked implementation of lists. Operations on lists. Dynamic implementation of linked lists, Operations. Comparison between Array and Dynamic Implementation of linked list. Linked implementation of stacks and queues. Circular lists, implementation of primitive operations. Doubly linked lists : continuous & dynamic implementation, operations.

Unit-3 Trees : Definition, Basic terminology, Binary tree, Array and Dynamic Implementation of a binary tree, primitive operations on binary trees. External and internal nodes. Binary tree traversals : preorder, inorder and postorder traversals. Representation of infix, postfix and prefix expressions using trees. Representation of lists as binary trees. Introduction to Binary Search Trees, B trees, B+ trees , AVL Trees, threaded trees, balanced multi way search trees,

Unit- 4 Graphs: Definition of undirected & Directed Graphs & Networks, Basic terminology, Representation of graphs,. Graph traversals and spanning forests, minimum-spanning trees, computer representation of graphs.

Tables : Definition, Hash Functions, Implementation & Applications.

Sorting & Searching : Basic Searching techniques (Linear & binary), Introduction to Sorting. Sorting using selection, insertion, bubble, merge, quick, radix, heap sort.

Text Book:

- Data Structures using C by A. M. Tenenbaum, Langsam, Moshe J. Augentem, PHI Pub.

Reference Books:

- Data Structures and Algorithms by A.V. Aho, J.E. Hopcroft and T.D. Ullman, Original edition, Addison-Wesley, 1999, Low Priced Edition.
- Fundamentals of Data structures by Ellis Horowitz & Sartaj Sahni, Pub, 1983,AW
- Fundamentals of computer algorithms by Horowitz Sahni and Rajasekaran.
- Data Structures and Program Design in C By Robert Kruse, PHI,
- Theory & Problems of Data Structures by Jr. Seymour Lipschetz, Schaum's outline by TMH
- Introduction to Computers Science -An algorithms approach , Jean Paul Tremblay, Richard B. Bunt, 2002, T.M.H.
- Data Structure and the Standard Template library – Willam J. Collins, 2003, T.M.H

Note: Eight questions will be set in all by the examiners taking at least two questions from each unit .Students will be required to attempt five questions in all at least one from each unit.

CSE-205 E

DISCRETE STRUCTURES

L T P
3 1 -

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

Unit-1 Set Theory: Introduction to set theory, Set operations, Algebra of sets, combination of sets, Duality, Finite and Infinite sets, Classes of sets, Power sets, Multi sets, Cartesian Product, Representation of relations, Types of relation, Binary Relations, Equivalence relations and partitions, Partial ordering relations and lattices, Mathematic Induction, Principle of Inclusion & Exclusion, Propositions.

Function and its types, Composition of function and relations, Cardinality and inverse relations. Function & Pigeo principles.

Unit-2 Propositional Calculus: Basic operations: AND(\wedge), OR(\vee), NOT(\sim), Truth value of a compound statement, propositions, tautologies, contradictions.

Techniques Of Counting: Rules of Sum of products, Permutations with and without repetition, Combination.

Recursion And Recurrence Relation :Polynomials and their evaluation, Sequences, Introduction to AP, GP and AG series, partial fractions, linear recurrence relation with constant coefficients, Homogeneous solutions, Particular solutions, Total solution of a recurrence relation using generating functions.

Unit-3 Algebraic Structures Definition, elementary properties of algebraic structures, examples of a Monoid, Submonoid, Semigroup, Groups and rings, Homomorphism, Isomorphism and Automorphism, Subgroups and Normal subgroups, Cyclic groups, Integral domain and fields, Cosets, Lagrange's theorem, Rings, Division Ring.

Unit-4 Graphs And Trees: Introduction to graphs, Directed and Undirected graphs, Homomorphic and Isomorphic graphs, Subgraphs, Cut points and Bridges, Multigraph and Weighted graph, Paths and circuits, Shortest path in weighted graphs, Eulerian path and circuits, Hamilton paths and circuits, Planar graphs, Euler's formula, Tree, Rooted Trees, Spanning Trees & cut-sets, Binary trees and its traversals

Text Book

- Elements of Discrete Mathematics C.L Liu, 1985, McGraw Hill
- **Reference Books:**
- Concrete Mathematics: A Foundation for Computer Science, Ronald Graham, Donald Knuth and Oren Patashnik, 1989, Addison-Wesley.
- Mathematical Structures for Computer Science, Judith L. Gersting, 1993, Computer Science Press.
- Applied Discrete Structures for Computer Science, Doerr and Levasseur, (Chicago: 1985,SRA
- Discrete Mathematics by A. Chtewynd and P. Diggle (Modular Mathematics series), 1995, Edward Arnold, London,
- Schaums Outline series: Theory and problems of Probability by S. Lipshutz, 1982, McGraw-Hill Singapore
- Discrete Mathematical Structures, B. Kolman and R.C. Busby, 1996, PHI
- Discrete Mathematical Structures with Applications to Computers by Tembley & Manohar, 1995, Mc Graw Hill.
- Discrete Mathematics & Structure, Satyender Bal Gupta, 2nd Ed., Luxmi Pub.
- **Note:** Eight questions will be set in all by the examiners taking at least two questions from each unit .Students will be required to attempt five questions in all at least one from each unit.

CSE-207 E

INTERNET FUNDAMENTALS

L	T	P
3	1	-

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

Unit-1

The Internet : Introduction to networks and internet, history, Internet, Intranet & Extranet, Working of Internet, Internet Congestion, internet culture, business culture on internet. Collaborative computing & the internet. Modes of Connecting to Internet, Internet Service Providers(ISPs), Internet address, standard address, domain name, DNS,IP.v6.Modems, Speed and time continuum, communications software; internet tools.

Unit-2:World Wide Web : Introduction, Miscellaneous Web Browser details, searching the www: Directories search engines and meta search engines, search fundamentals, searchstrategies, working of the search engines, Telnet and FTP, HTTP, Gopher Commands, TCP/IP.

Introduction to Browser, Coast-to-coast surfing, hypertext markup language, Web page installation, Web page setup, Basics of HTML & formatting and hyperlink creation.UsingFrontPage Express, Plug-ins.

Unit-3:Electronic Mail: Introduction, advantages and disadvantages, User Ids, Pass words, e-mail addresses, message components, message composition, mailer features, E-mail inner workings, E-mail management, MIME types, Newsgroups, mailing lists, chat rooms, secure-mails, SMTP, PICO, Pine, Library cards catalog, online ref. works.

Languages: Basic and advanced HTML, Basics of scripting languages – XML, DHTML, Java Script.

Unit-4:Servers : Introduction to Web Servers: PWS, IIS, Apache; Microsoft Personal Web Server. Accessing & using these servers.

Privacy and security topics: Introduction, Software Complexity, Attacks, security and privacy levels, security policy, accessibility and risk analysis, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Intrusion detection systems

Text Book:

- ? Fundamentals of the Internet and the World Wide Web, Raymond Greenlaw and Ellen Hepp – 2001, TMH
- ? Internet & World Wide Programming, Deitel,Deitel & Nieto, 2000, Pearson Education

Reference Books:

- Complete idiots guide to java script,. Aron Weiss, QUE, 1997
- Network firewalls, Kironjeet syan -New Rider Pub.
- Networking Essentials – Firewall Media.
- www.secinf.com
- www.hackers.com
- Alfred Gkossbrenner-Internet 101 Computing MGH, 1996

Note: Eight questions will be set in all by the examiners taking at least two questions from each unit .Students will be required to attempt five questions in all at least one from each unit.

(ECE-203E)

ANALOG COMMUNICATION

L T P
3 1 -

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

NOISE: Classification of Noise, Various sources of Noise, Methods of Noise Calculation in networks and inter connected networks. Addition of noise due to several sources; noise in amplifiers in cascade, noise in reactive circuits, Noise figure, its calculation and measurement. Noise temperature, Mathematical representation of random noise, narrow band noise and its representation. Transmission of noise through linear systems, signal to noise ratio, noise bandwidth.

UNIT-II

MODULATION TECHNIQUES: Basic constituents of Communication Systems, need of modulation, Amplitude modulation, spectrum of AM wave, modulation index, DSBSC modulation, SSB Modulation, Collector modulation, Square law modulation methods, Methods of generating SSB Signals, vestigial side band modulation, Detection of AM Signal; Diode detector, Square Law Detector. Time Constant RC in diode detector. Diode detector with filter. FDM, Power relations in AM wave.

UNIT-III

ANGLE MODULATION: frequency and phase modulation, spectrum of FM Wave, modulation index and Bandwidth of FM Signal, NBFM and WBFM, Comparison between FM and PM Signals, FM and AM signals, AM and NBFM Signals, FM generation methods, Demodulation methods; slope detector, ratio detector, Foster-Seeley discriminator. Pre-emphasis & De-emphasis, effect of noise on carrier; noise triangle.

UNIT-IV

TRANSMITTER AND RECEIVER: Classification of radio transmitters, Block diagram of AM transmitter, Frequency Scintillation, Frequency drift, Radio broadcast transmitter, Radio telephone transmitter, Privacy devices, Armstrong FM transmitter, Simple FM transmitter using Reactance modulator. Classification of radio receivers, TRF receives, superheterodyne receivers, Image Signal rejection, frequency mixers. Tracking and alignment of receivers, Intermediate frequency, AGC, AFC, SSB receiver.

REFERENCE BOOKS:

1. Taub & Schilling, Principles of Communication Systems, TMH.
2. Mithal G K, Radio Engineering, Khanna Pub.
3. Sirnon Haykin, Communication Systems, John Wiley.
4. Dungan F.R., Electronics Communication System, Thomson-Delmar
5. Electronics Communication System: Kennedy; TMH

NOTE:

Eight questions are to be set in all by the examiner taking two questions from each unit. Students will be required to attempt five questions in all.

CSE-253 E

Internet Lab (3rd Sem)

L	T	P
-	-	3

Sessional Work:	50 Marks
Exam:	25 Marks
Total:	75Marks
Duration of Exam:	3 Hrs.

List of Experiments

1. To prepare the Your Bio Data using MS Word.
2. To prepare the list of marks obtained by students in different subjects and show with the help of chart/graph the average, min. and max. Marks in each subject.
3. Prepare a presentation explaining the facilities/infrastructure available in your collage/institute.
4. Design Web pages containing information of the Dep't.
5. Create a new document that takes the format of a business letter. Combine <P> and
 tags to properly separate the different parts of the document. Such as the address, greeting, content and signature. What works best for each?
6. Create a document that use multiple
 and <P> tags, and put returns between <PRE> tags to add blank lines to your document see if your browser renders them differently.
7. Create a document use the <PRE> tags to works as an invoice or bill of sale, complete with aligned dollar values and a total. Remember not to use the Tab key, and avoid using emphasis tags like or within your list.
8. Create a seven-item ordered list using Roman numerals. After the fifth item, increase the next list value by 5.
9. Beginning with an ordered list, create a list that nests both an unordered list and a definition list.
10. Use the ALIGN attribute or an tags to align another image to the top of the first image... play with this feature, aligning images to TOP, MIDDLE and BOTTOM.
11. Create a 'table of contents' style page (using regular and section links) that loads a different document for each chapter or section of the document.
12. Study of E-mail system.
13. Create your own mail-id in yahoo and indiatimes.com.
14. Add names (mail-id's) in your address book, compose and search an element.

CSE-209E

Database Management System Lab. (3rd Sem)

L T P
- - 3

Sectional Work: 25 Marks
Examination: 25 Marks
Total: 50 Marks
Duration of Exam: 3 Hrs.

List of Experiments

1. Create a database and write the programs to carry out the following operation:
 1. Add a record in the database
 2. Delete a record in the database
 3. Modify the record in the database
 4. Generate queries
 5. Data operations
 6. List all the records of database in ascending order.
2. Create a view to display details of employees working on more than one project.
3. Create a view to display details of employees not working on more than one project
4. Create a view to display employees name and projects name for employees working on projects <P1 and P3> or <P2 and P4>.
5. Using two tables create a view which shall perform EQUIJOIN.
6. Write trigger for before and after insertion. Detection and updation process.
7. Write a procedure to give incentive to employees working on all projects. If no such employee found give app. Message.
8. Write a procedure for computing amount telephone bill on the basic of following conditions.

CSE-211E

Data Structures Lab. (3rd SEM)

L **T** **P**
- - 3

Sectional Work: 50 Marks
Examination: 25 Marks
Total: 75 Marks
Duration of Exam: 3 Hrs.

List of Experiment

1. Write a program to search an element in a two-dimensional array using linear search.
2. Using iteration and recursion concepts write programs for finding the element in the array using Binary search method.
3. Write a program to perform following operations on tables using functions only a) Addition b) Subtraction c) multiplication d) Transpose
4. Write a program to implement Linear Queue.
5. Write a program to implement Stack using Array.
6. Write a program to implement the various operations on string such as length of string concatenation, reverse of a string & copy of a string to another.
7. Write a program to swapping of two numbers using 'call by value' and call by reference strategies.
8. Write a program to implement binary search tree. (Insertion and traversal in Binary Search Tree).
9. Write a program to implement binary search tree. (Deletion in Binary Search Tree).
10. Write a program to create a linked list & perform operations such as insert, delete and display the contents of the linked list.
11. Write a Program to reverse a linked list.
12. Write a program to implement linear search and binary search
13. Write a program to implement selection sort by using different algorithms
14. Write a program to implement bubble sort
15. Write a program to implement insertion sort.
16. Write a program to simulate the graph traversal using bfs.

(ECE-207E)

ANALOG COMMUNICATION LAB

L **T** **P**
- - 2

Sessional : 25 Marks
Viva : 25 Marks
Total : 50 Marks
Time : 3hrs.

LIST OF EXPERIMENTS

1. i) To study Double Sideband Amplitude Modulation and determine its Modulation factor and power in sidebands.
ii) To study amplitude demodulation by linear diode detector.
2. i) To study Frequency Modulation and determine its modulation factor.
ii) To study PLL 565 as frequency demodulator
3. To study Sampling and reconstruction of pulse amplitude modulation system.
4. To study the Sensitivity characteristics of superhetrodyne receiver.
5. To study the Selectivity characteristics of superhetrodyne receiver.
6. To study the Fidelity characteristics of superhetrodyne receiver.
7. i) To study Pulse Amplitude Modulation
 - a) Using switching method
 - b) By sample and hold circuit.ii) To demodulate the obtained PAM signal by IInd order Low pass filter.
8. To study Pulse Width Modulation / Demodulation.
9. To study Pulse Position Modulation / Demodulation.
10. To study active filters (Low-pass, High-pass, Band-pass, Notch filter).

KURUKSHETRA UNIVERSITY KURUKSHETRA
SCHEME OF STUDIES & EXAMINATIONS
B.Tech. 2nd YEAR (SEMESTER-IV)

Scheme of Computer 4th sem										
S. No.	Code	Subject Name	Weekly Load				Exam. Sch.			
			L	T	P/D	Tot	Th	Ses	Pr	T
1	MATH-201E	Mathematics-III	3	1		4	100	50		150
2	CSE-202E	Computer Arch. & Org.	3	1		4	100	50		150
3	CSE-204E	Programming Lang.	3	1		4	100	50		150
4	IT-252E	Object Oriented Pr. Using C++	3	1		4	100	50		150
5	ECE-204E	Digital Elect.	3	1		4	100	50		150
6	ECE-216E	Microprocessor & Interfacing	3	1		4	100	50		150
7	IT-256E	C++ Programming Lab			3	3		50	25	75
8	ECE-210E	Digital Elect. Lab			3	3		50	25	75
9	ECE-218E	Microprocessor & Interfacing Lab			3	3		25	25	50
10	GPCSE-210	Gen Prof./Pract. Training	1			1		50		50
		Total	19	6	9	34	600	475	75	1150

MATH-201 E

MATHEMATICS – III

L T P
3 1 -

Theory : 100 Marks
Sessional : 50 Marks
Total : 150 Marks
Time Duration: 3Hrs

UNIT - I

Fourier Series : Euler's Formulae, Conditions for Fourier expansions, Fourier expansion of functions having points of discontinuity, change of interval, Odd & even functions, Half-range series.

Fourier Transforms : Fourier integrals, Fourier transforms, Fourier cosine and sine transforms. Properties of Fourier transforms, Convolution theorem, Parseval's identity, Relation between Fourier and Laplace transforms, Fourier transforms of the derivatives of a function, Application to boundary value problems.

UNIT-II

Functions of a Complex Variables : Functions of a complex variable, Exponential function, Trigonometric, Hyperbolic and Logarithmic functions, limit and continuity of a function, Differentiability and analyticity.

Cauchy-Riemann equations, Necessary and sufficient conditions for a function to be analytic, Polar form of the Cauchy-Riemann equations, Harmonic functions, Application to flow problems, Conformal transformation, Standard transformations (Translation, Magnification & rotation, inversion & reflection, Bilinear).

UNIT-III

Probability Distributions : Probability, Baye's theorem, Discrete & Continuous probability distributions, Moment generating function, Probability generating function, Properties and applications of Binomial, Poisson and normal distributions.

UNIT-IV

Linear Programming : Linear programming problems formulation, Solution of Linear Programming Problem using Graphical method, Simplex Method, Dual-Simplex Method.

Text Book

Higher Engg. Mathematics : B.S. Grewal
Advanced Engg. Mathematics : E. Kreyzig

Reference Book

Complex variables and Applications : R.V. Churchill; Mc. Graw Hill
Engg. Mathematics Vol. II: S.S. Sastry; Prentice Hall of India.
Operation Research : H.A. Taha.
Probability and statistics for Engineer : Johnson. PHI.

Note : Examiner will set eight question, taking two from each unit. Students will be required to attempt five questions taking at least one from each unit.

CSE- 202 E

COMPUTER ARCHITECTURE & ORGANIZATION

L T P
3 1 -

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

Unit-1: General System Architecture: Store program control concept, Flynn's classification of computers (SISD, MISD, MIMD); Multilevel viewpoint of a machine: digital logic, micro architecture, ISA, operating systems, high level language; structured organization; CPU, caches, main memory, secondary memory units & I/O; Performance metrics; MIPS, MFLOPS.

Instruction Set Architecture: Instruction set based classification of processors (RISC, CISC, and their comparison); addressing modes: register, immediate, direct, indirect, indexed; Operations in the instruction set; Arithmetic and Logical, Data Transfer, Machine Control Flow; Instruction set formats (fixed, variable, hybrid); Language of the machine: 8086 ; simulation using MASM

Unit-2: Basic non pipelined CPU Architecture: CPU Architecture types (accumulator, register, stack, memory/register) detailed data path of a typical register based CPU, Fetch-Decode-Execute cycle (typically 3 to 5 stage); microinstruction sequencing, implementation of control unit, Enhancing performance with pipelining. Hardwired control design method, Micro programmed control unit.

Unit-3: Memory Hierarchy & I/O Techniques: The need for a memory hierarchy (Locality of reference principle, Memory hierarchy in practice: Cache, main memory and secondary memory, Memory parameters: access/ cycle time, cost per bit); Main memory (Semiconductor RAM & ROM organization, memory expansion, Static & dynamic memory types); Cache memory (Associative & direct mapped cache organizations. Allocation & replacement policies, segments, pages & file organization, virtual memory.

Unit-4: Introduction to Parallelism: Goals of parallelism (Exploitation of concurrency, throughput enhancement); Amdahl's law; Instruction level parallelism (pipelining, super scaling –basic features); Processor level parallelism (Multiprocessor systems overview).

Computer Organization [80x86]: Instruction codes, computer register, computer instructions, timing and control, instruction cycle, type of instructions, memory reference, register reference. I/O reference, Basics of Logic Design, accumulator logic, Control memory, address sequencing, micro-instruction formats, micro-program sequencer, Stack Organization, Instruction Formats, Types of interrupts; Memory Hierarchy. Programmed I/O, DMA & Interrupts.

Text Books:

- Computer Organization and Design, 2nd Ed., by David A. Patterson and John L. Hennessy, Morgan 1997, Kauffmann.
- Computer Architecture and Organization, 3rd Ed., by John P. Hayes, 1998, TMH.

Reference Books:

- Operating Systems Internals and Design Principles by William Stallings, 4th edition, 2001, Prentice-Hall Upper Saddle River, New Jersey
- Computer Organization, 5th Ed., by Carl Hamacher, Zvonko Vranesic, 2002, Safwat Zaky.
- Structured Computer Organisation by A.S. Tanenbaum, 4th edition, Prentice-Hall of India, 1999, Eastern Economic Edition.
- Computer Organisation & Architecture: Designing for performance by W. Stallings, 4th edition, 1996, Prentice-Hall International.
- Computer Architecture & Organisation by M. Mano, 1990, Prentice-Hall.

- Computer Architecture- Nicholas Carter, 2002, T.M.H.

Note : Examiner will set eight question, taking two from each unit. Students will be required to attempt five questions taking at least one from each unit.

CSE-204E

PROGRAMMING LANGUAGE

L T P
3 1 -

Exam: 100 Marks
Sessional: 50 Marks
Total: 150 Marks
Duration of Exam: 3 Hrs

Unit 1

Introduction: A brief history, Characteristics of a good programming language, Programming language translators compiler & interpreters Elementary data types – Data objects, variable & constants, data types, Specification & implementation of elementary data types Declaration, type checking & type conversions . Assignment & initialization, Numeric data types, enumerations, Boolean & characters.

Syntax & Semantics: Introduction, general problem of describing syntax, formal method of describing syntax, attribute grammar dynamic semantic.

UNIT 2

Structured data objects: Structured data objects & data types, specification & implementation of structured data types. Declaration & type checking of data structure, vector & array, records Character strings variable size data structure, Union, Pointer & programmer defined data objects, sets, files..

Subprograms and Programmer defined data types: Evolution of data type concept abstraction, encapsulation and information hiding, Subprograms type definitions abstract data types, over loaded subprograms, generic subprograms.

UNIT 3

Sequence Control: Implicit & explicit sequence control, sequence control within expressions, sequence control within statement, subprogram sequence control: simple call return, recursive subprograms, Exception & exception handlers, co routines, sequence control, Concurrency- subprograms level concurrency, Synchronization through semaphores, Monitors and message passing

Data Control: Names and Referencing environment, static and dynamic scope, block structure, local data and local referencing environment, share data: dynamic and static scopes, parameters and parameter transmission schemes.

UNIT 4

Storage Management: Major run time elements requiring storage, programmer and system control storage management and phases, static storage management, stack based storage management, Heap storage management, variables and fixed size elements

Programming language: Introduction to procedural, Non-procedural, Structured, Logical, functional and object oriented programming language, Comparison of C and C++ programming language.

Text Books:

1. Design and Implementation by T.W.Pratt 1996, Prentice Hall Pub.
2. Programming language – Principles and Paradigms by Allen Trucker& Robert Noonan, 2002 TMH

Reference:

- Fundamentals of Programming language by Ellis Horowitz. 1984, Galgotia publications (Springer Verlag).
- Programming language concepts by C.Ghezzi, 1989 Wiley Publications.
- Programming language- Principles and Paradigms, Allen trucker, Robert Noonan 2002, T.M.H

Note: - There will be 8 questions in all. Two questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

IT-252E

OBJECT ORIENTED PROGRAMMING USING C++

L T P
3 1 -

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

Unit-1:

Introduction to C++, C++ Standard Library, Basics of a typical C++ environment, Pre-processors Directives, Illustrative Simple C++ Programs, Header Files and namespaces, Library Files, Concept of objects, Basic of Object Modeling, Object classes, Associations, Behaviours, Description, Object oriented analysis & object modeling techniques

Object Oriented Concepts: Introduction to objects and object oriented Programming, Encapsulation (information hiding), Access modifiers: Controlling Access to a class, method or variable (public, protected, private, package), other modifiers, Polymorphism, Overloading, Inheritance, Overriding methods, Abstract Classes, Reusability, Class's Behaviours.

Classes And data Abstraction: Introduction, Structure definitions, accessing Members of structures, Class scope and accessing Class Members, separating interface from implementation, controlling access function and utility function, initializing class objects: Constructors using default arguments with constructors, Using Destructors, classes: const (constant) objects and const member functions, Object as member of classes, friend function and friend classes, Using this pointer, Dynamic Memory Allocation with New and delete, static Class members,, Container Classes and integrators, Proxy classes, Function overloading

Unit-2:

Operator Overloading: Introduction, Fundamentals of operator overloading, Restrictions on operator overloading, Operator Functions as class members vs. as friend Functions, Overloading <<, >>, Overloading unary operators, Overloading Binary operators

Inheritance : Inheritance: Introduction, Inheritance: Base Classes and Derived classes, Protected members, Casting Base-Class Pointers to derived Class pointers, Using Member functions, Overriding Base class members in a derived class, Public, protected and private inheritance, Using Constructors and destructors in derived classes, Implicit Derived class object to base-Class object Conversion, Composition Vs. Inheritance

Unit 3:

Virtual Functions & Polymorphism: Introduction to virtual functions, abstract base classes and concrete classes, Polymorphism, New classes and dynamic binding, virtual destructors, Polymorphism, Dynamic Binding.

Files and I/O streams: File and streams, creating a sequential access file, Reading data from a sequential access file, Updating sequential access files, Random access files, creating random access files, writing data randomly to a random access file, Reading data sequentially from a random access file, Stream input/output-classes and objects, Stream Output, Stream input, Unformatted I/O (with read and write), stream manipulators, Stream format states, stream error states.

Unit 4:

Templates & Exception handling: Function templates, overloading template functions, class templates, Class templates and non type parameters, Templates and inheritance, Templates and friends, Templates and static members

Introduction, Basics of C++ Exception handling: Try throw, catch, Throwing an exception, Catching an exception, Rethrowing an exception, Exception Specifications, Processing Unexpected Exceptions, Stack unwinding, Constructors, Destructors and Exception Handling, Exceptions and inheritance.

Text Books:

- C++ How to Program by H M Deitel and P J Deitel, 1998, Prentice Hall
- Object Oriented Programming in Turbo C++ by Robert Lafore, 1994, The Waite Group Press
- Programming with C++ by D Ravinchandran, 2003, T.M.H.

Reference Books:

Object Oriented programming with C++ by E balagurusamy, 2001, TMH
Computing Concepts with C++ Essentials by Horstmann, 2003, John Wiley,
The Complete Reference in C++ by Herbert Schildt, 2002, TMH.
C++ Programming Fundamentals by Chuck Easttom, Firewall Media

Note: Eight Questions will be set in all by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all at least one from each unit.

(ECE-204E)

DIGITAL ELECTRONICS

L T P
3 1 -

Theory : 100Marks
Sessional : 50Marks
Total : 150Marks
Duration of Exam: 3Hrs.

UNIT 1 FUNDAMENTALS OF DIGITAL TECHNIQUES:

Digital signal, logic gates: AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR, Boolean algebra. Review of Number systems. Binary codes: BCD, Excess-3, Gray codes.

COMBINATIONAL DESIGN USING GATES:

Design using gates. Karnaugh map and Quine McCluskey methods of simplification.

UNIT 2 COMBINATIONAL DESIGN USING MSI DEVICES

Multiplexers and Demultiplexers and their use as logic elements. Decoders. Adders / Subtractors. BCD arithmetic Circuits. Encoders. Decoders / Drivers for display devices.

SEQUENTIAL CIRCUITS:

Flip Flops: S-R, J-K, T, D, master-slave, edge triggered- shift registers, sequence generators. Counters. Asynchronous and Synchronous Ring counters and Johnson Counter, Design of Synchronous and Asynchronous sequential circuits.

UNIT 3 DIGITAL LOGIC FAMILIES:

Switching mode operation of p-n junction, bipolar and MOS-devices. Bipolar logic families: RTL, DTL, DCTL, HTL, TTL, ECL, MOS, and CMOS logic families. Tristate logic. Interfacing of CMOS and TTL families.

UNIT 4 A/D AND D/A CONVERTERS:

Sample and hold circuit, weighted resistor and R-2R ladder D/A Converters, specifications for D/A converters. A/D converters: Quantization, parallel-comparator, successive approximation, counting type. Dual-slope ADC, specifications of ADCs.

PROGRAMMABLE LOGIC DEVICES:

ROM, PLA, PAL, Introduction to FPGA and CPLDs.

TEXT BOOK:

1. Modern Digital Electronics (Edition III): R. P. Jain; TMH

REFERENCE BOOKS:

1. Digital Integrated Electronics: Taub & Schilling: MGH
2. Digital Principles and Applications: Malvino & Leach: McGraw Hill.
3. Digital Design: Morris Mano: PHI,

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

ECE-216 E

L T P

3 1 -

MICROPROCESSORS AND INTERFACING

Sessional: 50 Marks

Exam: 100 Marks

Total: 150 Marks

Duration of Exam: 3 Hrs.

Unit-1:

THE 8085 PROCESSOR : Introduction to microprocessor, 8085 microprocessor : Architecture, instruction set, interrupt structure, and assembly language programming.

MEMORY INTERFACING: Semiconductor memory and its types- Static and dynamic RAM, ROM, EPROM, EEROM and NOVRAM- Interfacing memory- Interfacing SRAM, DRAM, EPROM etc. Timing of RAM and ROM signals.

Unit-2 :

THE 8086 MICROPROCESSOR ARCHITECTURE : Architecture, block diagram of 8086, details of sub-blocks such as EU, BIU; memory segmentation and physical address computations, program relocation, addressing modes, instruction formats, pin diagram and description of various signals.

INSTRUCTION SET OF 8086 : Instruction execution timing, assembler instruction format, data transfer instructions, arithmetic instructions, branch instructions, looping instructions, NOP and HLT instructions, flag manipulation instructions, logical instructions, shift and rotate instructions, directives and operators, programming examples.

Unit-3 :

INTERFACING DEVICE : The 8255 PPI chip: Architecture, control words, modes and examples. Interfacing D/A and A/D converters

Unit-4: DMA : Introduction to DMA process, 8237 DMA controller,

INTERRUPT AND TIMER : 8259 Programmable interrupt controller, Programmable interval timer chips.

Text Books :

- Microprocessor Architecture, Programming & Applications with 8085 : Ramesh S Gaonkar; Wiley Eastern Ltd.
- The Intel Microprocessors 8086- Pentium processor : Brey; PHI

Reference Books :

- Microprocessors and interfacing : Hall; TMH
- The 8088 & 8086 Microprocessors-Programming, interfacing, Hardware & Applications : Triebel & Singh; PHI
- Microcomputer systems : the 8086/8088 Family: architecture, Programming & Design : Yu-Chang Liu & Glenn A Gibson; PHI
- Advanced Microprocessors and Interfacing : Badri Ram; TMH

NOTE: Eight questions are to be set in all by the examiner taking at least one question from each unit. Students will be required to attempt five questions in all.

IT-256 E

C ++ Programming Lab.(4th Sem)

L	T	P
-	-	3

Sessional Work: 50 Marks**Exam: 25 Marks****Total: 75 Marks****Duration of Exam: 3 Hrs**

List of Experiments

- Q1. Raising a number n to a power p is the same as multiplying n by itself p times. Write a function called `power ()` that takes a double value for n and an int value for p , and returns the result as double value. Use a default argument of 2 for p , so that if this argument is omitted, the number will be squared. Write a main () function that gets values from the user to test this function.
- Q2. A point on the two dimensional plane can be represented by two numbers: an X coordinate and a Y coordinate. For example, (4,5) represents a point 4 units to the right of the origin along the X axis and 5 units up the Y axis. The sum of two points can be defined as a new point whose X coordinate is the sum of the X coordinates of the points and whose Y coordinate is the sum of their Y coordinates. Write a program that uses a structure called `point` to model a point. Define three points, and have the user input values to two of them. Then set the third point equal to the sum of the other two, and display the value of the new point. Interaction with the program might look like this:
 Enter coordinates for P1: 3 4
 Enter coordinates for P2: 5 7
 Coordinates of P1 + P2 are : 8, 11
- Q 3. Create the equivalent of a four function calculator. The program should request the user to enter a number, an operator, and another number. It should then carry out the specified arithmetical operation: adding, subtracting, multiplying, or dividing the two numbers. (It should use a switch statement to select the operation). Finally it should display the result. When it finishes the calculation, the program should ask if the user wants to do another calculation. The response can be 'Y' or 'N'. Some sample interaction with the program might look like this. Enter first number, operator, second number: 10/ 3 Answer = 3.333333
 Do another (Y/ N)? Y
 Enter first number, operator, second number 12 + 100
 Answer = 112
 Do another (Y/ N) ? N
- Q4. A phone number, such as (212) 767-8900, can be thought of as having three parts: the area code (212), the exchange (767) and the number (8900). Write a program that uses a structure to store these three parts of a phone number separately. Call the structure `phone`. Create two structure variables of type `phone`. Initialize one, and have the user input a number for the other one. Then display both numbers. The interchange might look like this:
 Enter your area code, exchange, and number: 415 555 1212
 My number is (212) 767-8900

Your number is (415) 555-1212

- Q 5. Create two classes DM and DB which store the value of distances. DM stores distances in metres and centimeters and DB in feet and inches. Write a program that can read values for the class objects and add one object of DM with another object of DB. Use a friend function to carry out the addition operation. The object that stores the results maybe a DM object or DB object, depending on the units in which the results are required. The display should be in the format of feet and inches or metres and centimetres depending on the object on display.
- Q 6. Create a class rational which represents a numerical value by two double values- NUMERATOR & DENOMINATOR. Include the following public member Functions:
① constructor with no arguments (default).
② constructor with two arguments.
③ void reduce() that reduces the rational number by eliminating the highest common factor between the numerator and denominator.
④ Overload + operator to add two rational number.
⑤ Overload >> operator to enable input through cin.
⑥ Overload << operator to enable output through cout.
Write a main () to test all the functions in the class.
- Q 7. Consider the following class definition
- ```
class father {
protected : int age;
public;
father (int x) { age = x;}
virtual void iam ()
{ cout << "I AM THE FATHER, my age is : "<< age<< endl;}
};
```
- Derive the two classes son and daughter from the above class and for each, define iam ( ) to write our similar but appropriate messages. You should also define suitable constructors for these classes Now, write a main ( ) that creates objects of the three classes and then calls iam ( ) for them. 335 Declare pointer to father. Successively, assign addresses of objects of the two derived classes to this pointer and in each case, call iam ( ) through the pointer to demonstrate polymorphism in action.
- Q 8. Write a program that creates a binary file by reading the data for the students from the terminal. The data of each student consist of roll no., name ( a string of 30 or lesser no. of characters) and marks.
- Q9. A hospital wants to create a database regarding its indoor patients. The information to store include
- Name of the patient
  - Date of admission
  - Disease
  - Date of discharge
- Create a structure to store the date (year, month and date as its members). Create a base class to store the above information. The member function should include functions to enter information and display a list of all the patients in the

- database. Create a derived class to store the age of the patients. List the information about all the to store the age of the patients. List the information about all the pediatric patients (less than twelve years in age).
- Q10. Make a class Employee with a name and salary. Make a class Manager inherit from Employee. Add an instance variable, named department, of type string. Supply a method to toString that prints the manager's name, department and salary. Make a class Executive inherit from Manager. Supply a method to String that prints the string "Executive" followed by the information stored in the Manager superclass object. Supply a test program that tests these classes and methods.
- Q11. Imagine a tollbooth with a class called toll Booth. The two data items are a type unsigned int to hold the total number of cars, and a type double to hold the total amount of money collected. A constructor initializes both these to 0. A member function called payingCar ( ) increments the car total and adds 0.50 to the cash total. Another function, called nopayCar ( ), increments the car total but adds nothing to the cash total. Finally, a member function called displays the two totals. Include a program to test this class. This program should allow the user to push one key to count a paying car, and another to count a nonpaying car. Pushing the ESC key should cause the program to print out the total cars and total cash and then exit.
- 336
- Q12. Write a function called reversit ( ) that reverses a string (an array of char). Use a for loop that swaps the first and last characters, then the second and next to last characters and so on. The string should be passed to reversit ( ) as an argument. Write a program to exercise reversit ( ). The program should get a string from the user, call reversit ( ), and print out the result. Use an input method that allows embedded blanks. Test the program with Napoleon's famous phrase, "Able was I ere I saw Elba".
- Q13. Create some objects of the string class, and put them in a Deque-some at the head of the Deque and some at the tail. Display the contents of the Deque using the forEach ( ) function and a user written display function. Then search the Deque for a particular string, using the first That ( ) function and display any strings that match. Finally remove all the items from the Deque using the getLeft ( ) function and display each item. Notice the order in which the items are displayed: Using getLeft ( ), those inserted on the left (head) of the Deque are removed in "last in first out" order while those put on the right side are removed in "first in first out" order. The opposite would be true if getRight ( ) were used.
- Q 14. Assume that a bank maintains two kinds of accounts for customers, one called as savings account and the other as current account. The savings account provides compound interest and withdrawal facilities but no cheque book facility. The current account provides cheque book facility but no interest. Current account holders should also maintain a minimum balance and if the balance falls below this level, a service charge is imposed. Create a class account that stores customer name, account number and type of account. From this derive the classes cur\_acct and sav\_acct to make them more specific to their requirements. Include necessary member functions in order to achieve the following tasks:
- Accept deposit from a customer and update the balance.
  - Display the balance.
  - Compute and deposit interest.
  - Permit withdrawal and update the balance.

- e) Check for the minimum balance, impose penalty, necessary and update the balance.
- f) Do not use any constructors. Use member functions to initialize the class members.

Q 15. Create a base class called shape. Use this class to store two double type values that could be used to compute the area of figures. Derive two specific classes called triangle and rectangle from the base shape. Add to the base class, a member function `set_data ( )` to initialize baseclass data members and another member function `display_area ( )` to compute and display the area of figures. Make `display_area ( )` as a virtual function and redefine this function in the derived classes to suit their requirements. Using these three classes, design a program that will accept dimensions of a triangle or a rectangle interactively and display the area. Remember the two values given as input will be treated as lengths of two sides in the case of rectangles and as base and height in the case of triangles and used as follows:

Area of rectangle =  $x * y$

Area of triangle =  $1/2 * X * Y$

ECE-210 E

Digital Electronics Lab.

L      T      P  
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Sessional:      25 Marks  
Exam:            25 Marks  
Total:            50 Marks  
Duration of Exam: 3 Hrs.

### LIST OF EXPERIMENTS

1. Study of TTL gates – AND, OR, NOT, NAND, NOR, EX-OR, EX-NOR.
2. Design & realize a given function using K-maps and verify its performance.
3. To verify the operation of multiplexer & Demultiplexer.
4. To verify the operation of comparator.
5. To verify the truth tables of S-R, J-K, T & D type flip flops.
6. To verify the operation of bi-directional shift register.
7. To design & verify the operation of 3-bit synchronous counter.
8. To design and verify the operation of synchronous UP/DOWN decade counter using J K flipflops& drive a seven-segment display using the same.
9. To design and verify the operation of asynchronous UP/DOWN decade counter using J K flipflops& drive a seven-segment display using the same.
10. To design & realize a sequence generator for a given sequence using J-K flipflops.
11. Study of CMOS NAND & NOR gates and interfacing between TTL and CMOS gates.
12. Design a 4-bit shift-register and verify its operation . Verify the operation of a ring counterand a Johnson counter.

ECE-218 E

## Microprocessors and Interfacing Lab.

L     T     P  
-     -     3

Sessional:     25 Marks  
Exam:           25 Marks  
Total:           50 Marks  
Duration of Exam: 3 Hrs.

### LIST OF EXPERIMENTS

1. Study of 8085 Microprocessor kit.
2. Write a program using 8085 and verify for :
  - a. addition of two 8-bit numbers.
  - b. addition of two 8-bit numbers (with carry).
3. Write a program using 8085 and verify for :
  - a. 8-bit subtraction (display borrow)
  - b. 16-bit subtraction (display borrow )
4. Write a program using 8085 for multiplication of two 8- bit numbers by repeated addition method. Check for minimum number of additions and test for typical data.
5. Write a program using 8085 for multiplication of two 8- bit numbers by bit rotation method and verify.
6. Write a program using 8085 for division of two 8- bit numbers by repeated subtraction method and test for typical data.
7. Write a program using 8085 for dividing two 8- bit numbers by bit rotation method and test for typical data.
8. Study of 8086 microprocessor kit
9. Write a program using 8086 for division of a defined double word (stored in a data segment) by another double word division and verify.
10. Write a program using 8086 for finding the square root of a given number and verify.
11. Write a program using 8086 for copying 12 bytes of data from source to destination and verify.
12. Write a program using 8086 and verify for:
  - a. Finding the largest number from an array.
  - b. Finding the smallest number from an array.
13. Write a program using 8086 for arranging an array of numbers in descending order and verify.
14. Write a program using 8086 for arranging an array of numbers in ascending order and verify.
15. Write a program for finding square of a number using look-up table and verify.
16. Write a program to interface a two digit number using seven-segment LEDs. Use 8085/8086 microprocessor and 8255 PPI.
17. Write a program to control the operation of stepper motor using 8085/8086 microprocessor and 8255 PPI.

**KURUKSHETRA UNIVERSITY KURUKSHETRA**  
**SCHEME OF STUDIES & EXAMINATIONS**  
**B.Tech. 3rd YEAR (SEMESTER-V)**

| Scheme of Computer 5th sem |          |                            |             |          |          |           |            |            |            |             |
|----------------------------|----------|----------------------------|-------------|----------|----------|-----------|------------|------------|------------|-------------|
| S. No.                     | Code     | Subject Name               | Weekly Load |          |          |           | Exam. Sch. |            |            |             |
|                            |          |                            | L           | T        | P/D      | Tot       | Th         | Ses        | Pr         | T           |
| 1                          | HUT-302E | Fundamentals of Management | 3           | 1        |          | 4         | 100        | 50         |            | 150         |
| 2                          | CSE-301  | D.A.A.                     | 4           | 1        |          | 5         | 100        | 25         |            | 125         |
| 3                          | CSE-303  | Computer N/W               | 3           | 2        |          | 5         | 75         | 50         |            | 125         |
| 4                          | CSE-305  | Automata Theory            | 4           | 2        |          | 6         | 100        | 50         |            | 150         |
| 5                          | CSE-307  | Operating Systems          | 3           | 1        |          | 4         | 75         | 25         |            | 100         |
| 6                          | CSE-311  | Advanced Technologies(Pr.) |             |          | 3        | 3         |            | 50         | 50         | 100         |
| 7                          | CSE-313  | Operating Systems (Pr.)    |             |          | 3        | 3         |            | 50         | 50         | 100         |
| 8                          | CSE-315  | D.A.A.(Pr.)                |             |          | 3        | 3         |            | 50         | 25         | 75          |
| 9                          | CSE-317  | Seminar                    |             | 2        |          |           |            | 50         |            | 50          |
| 10                         | CSE-319  | Training Viva              |             |          |          |           |            | 75         |            | 75          |
|                            |          | <b>Total</b>               | <b>17</b>   | <b>9</b> | <b>9</b> | <b>33</b> | <b>450</b> | <b>475</b> | <b>125</b> | <b>1050</b> |

**HUT-302E**

**FUNDAMENTALS OF MANAGEMENT**

**L T**  
**3 1**

**Theory: 100Marks**  
**Sessionals: 50 Marks**  
**Total: 150 Marks**  
**Time: 3 hours**

**UNIT -1**

Financial Management

Introduction of Financial Management, Objectives of Financial Decisions, Status and duties of Financial Executives. Financial Planning factors affecting requirement of working capital.

Capital structure decisions. Features of appropriate capital structure. Sources of finance.

Financial Planning- tools of financial planning, management of working capital

**UNIT-2**

Personal Management

Personnel Management-Meaning, Nature and Importance; Functions of Personals

Management-(a) Managerial; Functions and (b) Operative functions. Job Analysis:

Meaning and Importance; Process of job Analysis; job Description and Job specification

Human Resource Development-Meaning and concept.

**UNIT-3**

Production Management.

Production Management: Definition and Objective

Plant location: Ideal plant location. Factors affecting plant location.

Plant Layout: Ideal plant layout, factors affecting plant layout.

Work Measurement: Meaning, Objectives and Essentials of work

Measurement.

Production Control Meaning and importance of production control and steps involved in production control.

**UNIT-4**

Marketing Management

Nature, scope and importance of marketing management. Modern Marketing concepts Role of marketing in economic development. Marketing Mix. Marketing information System. Meaning, nature and scope of International Marketing.

**NOTE:**

The question paper shall have eight questions in all organized into four sections, each section having two questions from each of the four units. The candidate shall have to attempt five questions in all, selecting at least one question from each unit.

**Suggested Books:**

1. Business Environment-Francis Charurilam (Himalaya Publishing house).
2. Management- Harold, Koontz and Cyrilo' Donell(Mc Graw Hill)
3. Principles of personals Management-Edwin B Flippo (Mc Graw Hill)
4. Personnel Management and Industrial Relations-D.C Sharma and R.C. Sharma(SJ Publications, Meerut)
5. Basic Marketing-Cundiff and Still (PHI,India)
6. Marketing Management-S.A. Sherlekar (Himalaya Publishing House Bombay )
7. Principles and Practices of Management –L.M. Prasad
8. Financial Management-I.M. Pandey (Vikas Publishing House, New Delhi)
9. International Marketing-Vorn terpestre and Ravi Sasathy.
10. Production Management-E.S. Buffa &W.H. Tausart, Richand D. Irwin, Homewood, Illinois.
11. Personnel Management-C.B. Mamoria, (Himalaya Publishing house)

CSE-301

## DESIGN & ANALYSIS OF ALGORITHMS

L    T    P  
4    1    -

Theory : 100  
Sessional : 50  
Time : 3Hrs

### Unit 1

#### Introduction:

Review of elementary data structures , analyzing algorithms , asymptotic notation, recurrence relations , Hash tables, Binary search trees.

#### Sorting and Order Statistics

Heap sort , Priority queues, Quick sort , Sorting in linear time, medians and order statistics, dynamic order statistics.

### UNIT 2

#### Advanced Design and Analysis Techniques

Dynamic programming – Elements , Matrix-chain multiplication , longest common subsequence , optimal polygon triangulation . Greedy algorithms Elements, activity selection problem , Huffman codes , task scheduling problem.

Advance data structure – operation in B-Trees, binomial Heaps, Fibonacci Heaps, Data structure for disjoint sets strings

### UNIT 3

#### Graph Algorithms

Review of graph algorithms , topological sort , strongly connected components , minimum spanning trees – Kruskal and Prim's , Single source shortest paths , relaxation , Dijkstra's algorithm , Bellman-Ford algorithm, single source shortest paths for directed acyclic graphs , difference constraints and shortest paths , All pairs shortest paths – shortest paths and matrix multiplication , Floyd – War shall algorithm , Johnson's algorithm.

### UNIT 4

#### Flow and Sorting Networks

Flow networks , Ford-Fulkerson method , Maximum bipartite matching , Sorting Networks , comparisons network , The zero-one principle , Bitonic network , merging network

**CSE-303**

## **COMPUTER NETWORKS**

L T P  
3 2 -

Theory: 75  
Sessional: 50

### **Unit 1.**

#### **Introduction**

Network Functions, Network Topology, Network services, switching Approaches, Transmission media and systems, multiplexing and signaling techniques, Error detection and correction, ISDN and BISDN

#### **Layered Architectures**

Example, OSI References Model, Overview of TCP/IP architecture, Socket system calls, SNMP, Electronic mail.

### **Unit 2.**

#### **Peer-to-Peer Protocols**

Protocols, Service Models and End-to-End requirements, ARQ, Sliding window, RTP, HDLC, PPP protocols, Statistical Multiplexing.

#### **MAC and LAN Protocols**

Multiple access communication, Random Access-ALOHA, Slotted ALOHA, CSMA, CSMA-CD, Channelization -: FDMA, TDMA, CDMA, Channelization in Cellular networks LAN Standards – 802.3, 802.4, 802.5.

802.6, FDDI, 802.11, LAN Bridges.

### **Unit 3.**

#### **Packet Switching Networks**

Packet network topology, Datagrams and Virtual Circuits- Structure of Switch/ Router, Connectionless and Virtual Circuit packet Switching, X.25, Routing Algorithms, ATM Networks, Traffic management and Q.S – FIFO, Priority Queues, Fair Queuing, Congestion Control Techniques.

### **Unit 4.**

#### **TCP/IP**

Architecture, Internet protocols – IP packet, Addressing, Subnet addressing, IP routing, CIDR, ARP, RARP, ICMP, Reassembly, IPv6, UDP, Transmission Control Protocol – TCP, Reliable stream service, operation, Protocol, DHCP, Mobile IP, Internet Routing Protocols, Multicast Routing.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### **BOOKS**

1. Leon Garcia and Indra Widjaja: Communication Networks – Fundamental Concepts and Key Architecture , TMH, 2000
2. A.S. tanenbaum: Computer Networks, 3/e, PHI, 1997.
3. Forouzan, Coombs and Fegan: Introduction to Data Communication and Networks, TMH, 1999
4. William Stallings: Data and Computer Communications 5/e, PHI

## AUTOMATA THEORY

### CSE-305

|   |   |   |
|---|---|---|
| L | T | P |
| 4 | 2 | - |

Theory: 100  
Sessional: 50

#### Unit-1

Finite automata and Regular expression: Finite state system, Basic Definition Non-Deterministic finite automata (NFA), Deterministic finite automata (DFA). Equivalence of DFA and NFA, finite automata with E-moves. Regular expression. Equivalence of finite Automata and expression, Regular expression conversion and vice-versa.

#### Unit – 2

Introduction to machines: CONCEPT OF BASIC MACHINES, Properties and limitations of FSM, Moore and Mealy Machines. Equivalence of Moore and Mealy machine Conversion of NFA and DFA by Arden's method. Properties of Regular sets: The Pumping Lemma for regular sets, Application of the Pumping Lemma, Closure Properties of regular sets, Myhill- Nerode Theorem and minimization of Finite Automata, Minimization Algorithm.

#### UNIT – 3

Grammars: Definition, Context free and Context sensitive Grammar, Ambiguity, Regular grammar, Reduced forms, Removal of useless symbols and unit production.

Chomsky Normal Form (CNF), Greibach Normal Form (GNF)

Pushdown Automata: Introduction to push-down machines, Application of Push down machines.

#### UNIT -4

Turing Machines, Deterministic and Non- Deterministic Turing Machines, Design of T.M, Halting Problem of T.M., PCP Problem.

Chomsky sensitive Language, Relation between languages of classes.

Computability: Basic Concepts, Primitive Recursive functions.

Chomsky Hierarchy- Chomsky hierarchies of grammars, unrestricted grammar

**Note:-** There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

#### Text Books

1. R. B. Patel, & Prem Nath, Theory of Automata and Formal Languages, Umesh Publication, New Delhi, 1<sup>st</sup> Edition 2005; ISBN-81-88114-53-7, pp. 1-496.
2. John C. Martin: Introduction to Languages and Theory of Computation, MGH.

#### Books

1. Lewis & Papadimitriou: Elements of Theory of computation, PHI.
2. Daniel I.A. Cohen: Introduction to computer Theory: John Wiley.
3. J.E.Hopcroft and J.D. Ullman: Introduction to Automata Theory Languages and Computation, Narosa.
4. Introduction to Automata Theory Language & computations- Hopcroft & O.D.Ullman, R.Motwani.
5. Theory of computer Sc.(Automata language & computation): K.L.P.Mishra & N.Chandrasekaran.
6. Introduction to formal language & automata – Peter Linz

## OPERATING SYSTEM

CSE-307

L T P

3 1 -

Theory:75

Sesional:25

### Unit 1

#### File & CPU Management

Operating System functions and characteristics, historical evolution of operating system. Real time systems, Distributed system, Methodologies for implementation of O/S service system calls, system program, Interrupt mechanism, concept of threading.

File system: Functions of the system, File access and allocation method, Directory system-implementation issues; hierarchy of file and device management.

CPU Scheduling: Level of Scheduling, Comparative study of scheduling algorithms, multiple processor scheduling.

Directory systems- Structure d organization, directory and file protection mechanism

### Unit 2

#### Storage & Device Management

Storage management: storage allocation method: single contiguous allocation, multiple contiguous allocation, paging, segmentation, combination of paging and segmentation. Virtual memory concepts, demand paging, page replacement algorithms, thrashing.

Device management: hardware organization, device scheduling, policies & I/O management.

Protection: mechanisms and policies, implementation.

### Unit 3

#### Deadlocks & Concurrency Control

Deadlock: Deadlock characterization, Deadlock prevention and avoidance, Deadlock detection and recovery, practical considerations.

Concurrent Processes: Critical section problem, Semaphores, Classical process coordination Problems and their solutions. Interprocess Communications, multithreading.

### Unit 4

#### Case Studies

DOS: Study of Dos with reference to storage management, device management, files system, interrupt mechanism.

UNIX: Study of UNIX with reference to storage management, file system, concurrency control. CPU scheduling.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

#### Books

1. Peterson. J.L. & Silbersehatz, A. Operating System Concepts, Addison, Wesley.
2. Brineh, Hansen, Operating System Principles, Prentice Hall of India.

Haberman, A.N.: Introduction to Operating System Design Galgotia Publication

COT-311

## Advance Technologies (Pr) (5<sup>th</sup> Sem)

**L**     **T**     **P**  
-     -     3

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

### List of Experiment

1. Learn Basic of Java Language and its Development Libraries /tools.
2. Generate an Editor screen containing menus, dialog boxes etc using Java.
3. Create an applet with a text field and three buttons. When you press each button, make some different text appear in the text field. Add a check box to applet created, capture the event and insert different text in the Text field.
4. Create a applet with a button and text field. Write an handle event () so that if the button has the focus, characters typed in to it will appear in the text field.
5. Create your own Java bean called VALUE that contains two properties: a Boolean called “on” and an integer called “Level”. Create a manifest file, use jar to package your own bean then load it in to the bean box or in to your own beans enabled program builder tool.
6. Develop a servlet that gets invoked when a form on a web page in HTML submitted. Create a cookie object and enter/display value for that cookie.
7. Java Networking Java sockets and RMI.
8. Programming under development tool ASP.net
9. Using Java develop a front end for a contact management program using a flat database. DB needs to be distributed or centralized.

CSE-313

## Operating System (5<sup>th</sup> SEM)

**L**     **T**     **P**  
-     -     3

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

### List of Experiments

1. Study of H/W & S/W requirement of different operating system.
2. Implementation of contiguous, linked and indirect allocation strategies assuming randomly generated free space list.
3. Implementation of worst, best & first fit contiguous allocation assuming randomly generated free space list.
4. Implementation of compaction for the continually changing memory layout & calculate total movement of data.
5. Calculation of external & Internal fragmentation for different program & for different page size.
6. Implementation of resource allocation graph.
7. Implementation of Banker's algorithm.
8. Conversion of response allocation graph to wait for graph.
9. Implementation of Bernstein's condition for concurrency.
10. Implementation of Fork & Join Construct.
11. Implementation of " Semaphore " for concurrency.

CSE-315

## Algorithm Design (5<sup>th</sup> Sem)

| L | T | P |
|---|---|---|
| - | - | 3 |

|                          |                 |
|--------------------------|-----------------|
| <b>Sectional Work:</b>   | <b>50 Marks</b> |
| <b>Examination:</b>      | <b>25 Marks</b> |
| <b>Total:</b>            | <b>75 Marks</b> |
| <b>Duration of Exam:</b> | <b>3 Hrs.</b>   |

1. Implement the minimum cost spanning tree.
2. Implement the shortest cost of optimal binary search tree.
3. Implement the shortest path algorithm.
4. Write a complete LC branch algorithm for job sequencing with deadlines problem. Use fixed tuple size formulation.
5. Write a LC branch and bound algorithm for the Knapsack problem using the fixed tuple size formulation.
6. Write a program to implement linear search algorithm.
7. Write a program to implement linear stack operation.
8. Write a program to implement Queue operation.
9. Write a program to implement Quick sort.
10. Write a program to implement heap sort

**KURUKSHETRA UNIVERSITY KURUKSHETRA**  
**SCHEME OF STUDIES & EXAMINATIONS**  
**B.Tech. 3rd YEAR (SEMESTER-VI)**

| Scheme of Computer 6th sem |         |                                         |             |          |          |           |            |            |            |             |
|----------------------------|---------|-----------------------------------------|-------------|----------|----------|-----------|------------|------------|------------|-------------|
| S. No.                     | Code    | Subject Name                            | Weekly Load |          |          |           | Exam. Sch. |            |            |             |
|                            |         |                                         | L           | T        | P/D      | Tot       | Th         | Ses        | Pr         | T           |
| 1                          | *       | Department Elective-I                   | 3           | 2        |          | 5         | 100        | 50         |            | 150         |
| 2                          | CSE-302 | Mobile Computing                        | 4           | 2        |          | 6         | 100        | 50         |            | 150         |
| 3                          | CSE-304 | Computer Hardware Technologies          | 4           | 1        |          | 5         | 100        | 25         |            | 125         |
| 4                          | CSE-306 | Network Management & security           | 4           | 1        |          | 5         | 100        | 50         |            | 150         |
| 5                          | CSE-308 | Software Engineering                    | 4           | 1        |          | 5         | 100        | 25         |            | 125         |
| 6                          | CSE-312 | Computer Hardware & Troubleshooting Lab |             |          | 3        | 3         |            | 50         | 50         | 100         |
| 7                          | CSE-314 | Mobile Computing Lab                    |             |          | 3        | 3         |            | 50         | 50         | 100         |
| 8                          | CSE-316 | Software Engineering Lab                |             |          | 3        | 3         |            | 50         | 50         | 100         |
|                            |         | <b>Total</b>                            | <b>19</b>   | <b>7</b> | <b>9</b> | <b>35</b> | <b>500</b> | <b>350</b> | <b>150</b> | <b>1000</b> |

**Departmental Elective:I (in 6th Sem)**

1. CSE-320 Digital Signal Processing
2. CSE-321 Multimedia Technique
3. CSE-322 Graph Theory & Combinations
4. CSE-323 Logic of Programming
5. CSE-324 Advance Database System
6. CSE-325 Parallel Computing

CSE-322

## GRAPH THEORY & COMBINATORIES

(Departmental Elective-I)

|   |   |   |
|---|---|---|
| L | T | P |
| 3 | 2 | 0 |

|            |           |
|------------|-----------|
| Theory:    | 100 Marks |
| Sessional: | 50 Marks  |

### Unit 1

#### Introduction

Basic Concepts, Subgraph, Vertex, Degree, Walks, Paths, Circuits, Cycles, Trees, Spanning Trees, Cut-Vertices and Cut-Edges, Connectivity, Euler tours and Hamiltonian Cycles, Matching, Perfect Matching, Connectivity and Separability, Network Flows, 1-Isomorphism and 2- Isomorphism.

### Unit 2

#### Advanced Features

Vertex Coloring, Chromatic Polynomial, Edge Coloring, Planar and Non-Planar Graphs, Euler's Formula, Kuratowski's Theorem, Test for Planarity, Directed Graphs, Tournaments networks, Max Flow, Min Cut Theorems, Graph Enumeration, Polya's Counting Theorem.

### Unit 3

#### Graph Algorithms

Computer Representation of Graph, Shortest Path Algorithms, Minimal Spanning Tree, Fundamental Circuit, Depth First Search, Planarity Testing, Directed Circuits, Isomorphism, Performance of Graph Theoretic Algorithms.

### Unit 4

#### Combinatorics

Basic Combination Numbers, Recurrence Relations, Generating Functions, Multinomial, Counting Principles, Polya's Theorem, Inclusion and Exclusion Principles, Block Design and Error Correcting Codes, Hadamard Matrices, Finite Geometry.

**Note:** There will be 8 questions in all. Two questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### Books

1. Deo N: Graph Theory and Applications, Prentice Hall
2. D.B West: Introduction to Graph Theory, Prentice Hall
3. S.A.Choudum: A First Course in Graph Theory, MacMillan [India]
4. V.Krishnamurthy: Theory and Applications, Affiliated East-West
5. Alan Tucker: Applied Combinatorics, Wiley.

CSE-302

## MOBILE COMPUTING

| L | T | P |
|---|---|---|
| 4 | 2 | - |

Theory: 100 Marks

Sessional : 50 Marks

### Unit 1

Introduction: Challenges in mobile Computing, coping with uncertainties, resources poorness, bandwidth, etc. Cellular architecture, Co-channel interference, Frequency reuse, capacity increase by cell splitting, Evolution of the mobile system : CDMA, TDMA, GSM.

Mobility Management: Cellular architecture, co-channel interface, Mobility handoff, location management, HLR-VLR Scheme, Hierarchical scheme, predictive location management schemes, Mobile IP, Cellular IP

### Unit 2

Publishing & Accessing Data in Air: Pull and push based data delivery models data dissemination by broadcast, broadcast disks, directory service in air, energy efficient indexing scheme for push based data delivery.

File System Support for Mobility: Distributed file sharing for mobility support, Coda and other storage for mobility support.

### Unit 3

Ad-Hoc Network routing protocols: Ad-Hoc Network routing protocols, destination sequenced distance vector algorithm, cluster based gateway switch routing, global state routing. Fish eye state routing, dynamic source routing, ad hoc on demand routing, location aided routing, Zonal routing algorithm.

### Unit 4

Mobile Transaction And Commerce: Models for mobile transaction, kangaroo and Joet Transactions, Recovery model for mobile transactions, Electronic payment and protocols for Mobile commerce.

Note: - There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### Books:

1. Mobility Process. Computer and Agents, Dejan Milojeie. Frederick Douglass, Richards Wheeler, Addison-Wesley Professional: 1<sup>st</sup> Edition (April 19, 1999).
2. Ivan Stojmenovic (Editor), Handbook of Wireless Networks & Mobile Computing, Wiley, ISBN: 0-471-41902-8. February 2002
3. Yi-Bing lin & Imrich Chlamtac."Wireless & Mobile Network Architecture". John Wiley & sons, 2001.
4. Raj Pandya."Mobile and Personal Communication Systems & Services". Prentices Hall of India. 2001

**CSE-304**

**COMPUTER HARDWARE TECHNOLOGIES**

L T P  
4 1 -

Theory: 100 Marks  
Sessional: 25 Marks

**Unit-1**

**Memory-**

Memory, Memory chips & modules, memory types, advanced memory technologies, troubleshooting memory.

**Power Supply**

Power supply function and operation, power supply quality and specification, power protection and backup, backup power system, UPS: trouble shooting power supply.

**Unit-2**

**Motherboard-**

PC family tree, motherboard controllers and system resources, input-output ports, IRQ, I/O bus system: ISA, MCA, EISA, VESA local bus, PCI, AGP, PCIX: on board I/O devices, ROMBIOS, ROM POST, CMOS setup.

**Unit-3**

**Interfaces and I/O Ports-**

Floppy disk interfaces, IDE interfaces: ATA standards, master slave configuration, data Transfer mode; SCSI bus, SCSI standards: This is better SCSI or IDE: serial ports, Parallel ports, USB, Video adapters, troubleshooting Video adapters.

**Unit-4**

**Devices drives and peripherals-**

Floppy disk drive, hard disk drive, CD-ROM drive, DVD ROM drive, recordable Drives, keyboards, mice, printers and monitors, troubleshooting drives and peripherals.

Note:- There will be 8 questions in all, two Questions will be set from each unit  
Students are required to attempt five questions selecting at least one question  
From each unit

**BOOKS**

1. Craig Zacker & John Rourke:PC Hardware-The Complete Reference.TMH.
2. Mark Minosi: The complete PC upgrade & Maintenance Guide 4/e.,BPB publications
3. S.K Chauhan: PC upgrading, maintenance and troubleshooting guide.

CSE-306

## NETWORK MANAGEMENT SECURITY

| L | T | P |
|---|---|---|
| 4 | 1 | - |

Theory: 100 Marks  
Sessional: 50 Marks

### Unit 1

Introduction: Need and Basic Goals for computer security, Security Threats ETC.

Cryptographic building blocks: Symmetric and asymmetric Key Cryptography, Cryptographic Hash Function, Digital Signature scheme etc., With representative application for each.

### UNIT 2

Operating System Security: low level protection Mechanism, Access control: Model for Access control ,some Confidentiality, Integrity and, hybrid Model of access control such as Bell-La Padula Model, Biba Model, Chinese Wall Model etc., Discretionary v/s Mandatory Access Control.

Case studies: Java Access control policy specification, SELinux security model and implementation. Program flaws: bugs which have security implications such as buffer overflows, race condition etc.

### UNIT 3

Malicious Code: Virus, Worms, Trojan Horses; how they work and how to defend against them.

Network Security: Problems in Network Security; Kinds of Attacks, PKI, Key exchange protocol, example protocol such as PGP, Kerberos, IPSEC/VPN, SSL, S/MIME etc.

### UNIT 4

Protocol Vulnerabilities: Example of protocol Vulnerabilities such as TCP/IP, denial of service attack, etc.

Tools for network security such as Firewall and Intrusion detection System.

Note: - There will be 8 questions in all. Two questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### Books

1. Michal E. Whitman & Herbert J. Mattord, Principles of Information Security. Vikash Publishing House Pvt. Ltd., New Delhi.
2. William Stallng "Cryptography and network security" Pearson Education.
3. Charles P. Pfleege "Security in computing" Prentice Hall.
4. Jeff Crume "Inside internet security" Addison Wesley.

**CSE-308**

**SOFTWARE ENGINEERING**

L T P  
4 1 -

Theory: 100 Marks  
Sessional: 25 Marks

Unit 1.

Software and Software engineering-Software characteristics, software crisis, software Engineering paradigms. Planning software project-software cost estimation, project scheduling, personal Planning, team structure.

Unit 2.

Software configuration management, quality assurance, project monitoring, risk Management. Software requirement analysis-structured analysis, object oriented analysis and data Modeling, software requirement specification, validation.

Unit 3.

Design and implementation of software-software design fundamentals, design Methodology (structured design and object oriented design), design verification, Monitoring and control coding. Software reliability: metric ad specification, fault avoidance and tolerance, exception Handling, defensive programming.

Unit 4.

Testing-Testing fundamentals, white box and black box testing, software testing Software testing strategies: unit testing, integration testing, validation testing, system Testing, debugging. Software Maintenance-maintenance characteristics, maintainability, maintenance tasks, maintenance side effects. CASE tools.

Note:-there will be 8 questions in all. Two Questions will be set from each unit.  
Students are required to attempt five questions selecting at least one question from Each unit.

Books:

1. Pressman S.Roger,Software Engineering, Tata McGraw-Hill
2. Jalote Pankaj, An integrated approach to software engineering, Narosa Publishing House
3. Somerville Ian, Software Engineering,5<sup>th</sup> ed. Addison Wesley-2000
4. Farley Richard, Software, Software Engineering , Tata McGraw-Hill

CSE-312

## Computer Hardware & Troubleshooting (6<sup>th</sup> Sem)

**L**    **T**    **P**  
-    -    3

**Sessional Work:**    50 Marks  
**Exam:**    50 Marks  
**Total:**    50 Marks  
**Duration of Exam:**    3 Hrs.

### List of Experiment

1. To solder and de-solder various components.
2. To check and measure various supply voltages of Pc.
3. To make comparative study of motherboards: 386,486 PI. PII. PIII.
4. To observe and study various cables, connections and parts used in computer Communication.
5. To study various cards used in a system viz. display card, LA1'rbrd etc.
6. To remove, study and replace Floppy disk drive.
7. To remove, study and replace hard disk.
8. To remove, study and replace CD ROM drive.
9. To study monitor, its circuitry and various presets and some elementary fault Detection.
10. To study printer assembly and elementary fault detection of DMP and laser Printers.
11. To observe various cables and connectors used in networking.
12. To study parts of keyboard and mouse.
13. To assemble a Pc.
14. Troubleshooting exercises related to various components of computer like monitor. drives, memory, and printers etc.

CSE-314

## Mobile Computing (Pr.) (6th Sem)

**L**    **T**    **P**  
-    -    3

**Sessional: 50 Marks**  
**Exam: 50 Marks**  
**Total: 100Marks**  
**Duration of Exam: 3 Hrs.**

### List of Experiments

1. Design a prototype that implements the Cache management for a mobile computing environment?
2. Design a System: The challenges or developing high performance, high reliability and high quality software systems are too much for ad hoc and informal engineering techniques that might have worked in the past on less demanding systems. New techniques for managing these growing complexities are required to meet today's time-to-market, productivity and quality demands.
3. Peer-to-peer communication system: As computers become more pervasive and homes become better connected, a new generation of applications will be deployed over the Internet. In this model, peer-to-peer applications become very attractive because they improve scalability and enhance performance by enabling direct and real-time communication among the peers. We need to propose a decentralized management system that manages the peer-to-peer applications and the system resources in an integrated way: monitors the behavior of the peer-to-peer applications transparently and obtains accurate resource projections. Manages the connections between the peers and distributes the objects in response to the user requests and changing processing and networking conditions.
4. Write programs that implement the few sorting algorithms (bubble, selection, etc.) for n data. It stops the operation when the counter for sorting index is at 100, 1000, 10000 and so on, stores the contents of the registers, program counter and partially sorted list of data, etc. It resumes the operation after 30 sec from the point of the termination.

5. Write a program that implements the bubble sort for n data. It stops the operation when the counter for sorting index is at 100, 1000, 10000. and so on. Stores the contents of the registers, program counter and partially sorted list of data. etc. It transfers the code and data - across the network on the new destination and resumes the operation from the point of termination on the previous node. Finally the result from the last node in the itinerary is sent back to the process-initiating node.
6. Develop a prototype that performs parallel computation of the same task on different nodes. Finally process initiator (master node)- receive Yes the result It and computation time required to complete the task on an each node and displays to the user. Compare the computing power of different nodes.

CSE-316

## Software Engineering (6<sup>th</sup> Sem)

L     T     P  
-     -     3

**Sectional Work:**     50 Marks  
**Examination:**     50 Marks  
**Total:**     100 Marks  
**Duration of Exam:**     3 Hrs.

### List of Experiments

1. (i) Implement Receipt Acknowledgement and updation of Inventory (RAUP)
  - a) Find unadjusted Functional points (UFP)
  - b) Calculate FPC by Mark II Method
2. To estimate effort and schedule  
Calculate the compression factor and the manpower required based on given information of software .
3. Implement a Testing strategy for the following software development cases:
  - (a). Rule based deterministic closed large but simple payroll system for a Company.
  - (b). Development of a customer relation management system for a retail distribution chain. The retail organization is not sure about the scope, and failure feature.
  - (c) Modification to existing order processing system for a multi location, Multi Product Company.
4. Build a work breakdown structure for the following
  - a) Delivery of the software, initiation to development covering lifecycle.
  - b) Development of prototype
  - c) Development of a process for a function
5. In a hospital management system develop the following diagrams for a Ward Service Management System (SMW).
  - (a) Work Flow
  - (b) System Flow
  - (c) DFDDevelop on effective modular design of SMW using these diagrams.
6. Draw three level DFD's for CLPS. Modularize the CLPS and structure them top-down as functional model.
7. Conduct a task analysis for the following users:
  - (a) officer at railway ticket reservation window

(b) officer at insurance claim settlement desk.

(c) clerk at call center. answering queries of customers who have purchased cars from the company.

8. Based on the business model of DEL develop a modular structure for a business system model. Draw a complete system flowchart.

**KURUKSHETRA UNIVERSITY KURUKSHETRA**  
**SCHEME OF STUDIES & EXAMINATIONS**  
**B.Tech. 4th YEAR (SEMESTER-VII)**

| Scheme of Computer 7th sem |         |                               |             |          |           |           |            |            |           |             |
|----------------------------|---------|-------------------------------|-------------|----------|-----------|-----------|------------|------------|-----------|-------------|
| S. No.                     | Code    | Subject Name                  | Weekly Load |          |           |           | Exam. Sch. |            |           |             |
|                            |         |                               | L           | T        | P/D       | Tot       | Th         | Ses        | Pr        | T           |
| 1                          | **      | Department Elective-II        | 3           | 1        |           | 4         | 75         | 50         |           | 125         |
| 2                          | ***     | Departmental Elective-III     | 3           | 1        |           | 4         | 75         | 50         |           | 125         |
| 3                          | CSE-401 | Compiler Design               | 4           | 1        |           | 5         | 100        | 25         |           | 125         |
| 4                          | CSE-403 | Web Engineering               | 3           | 1        |           | 4         | 75         | 25         |           | 100         |
| 5                          | CSE-405 | S.M.C.S.                      | 4           | 1        |           | 5         | 100        | 25         |           | 125         |
| 6                          | CSE-407 | Unix & Linux Programming(Pr.) |             |          | 3         | 3         |            | 50         | 50        | 100         |
| 7                          | CSE-409 | Web Engineering(Pr.)          |             |          | 2         | 2         |            | 25         | 25        | 50          |
| 8                          | CSE-411 | Minor Project                 |             |          | 6         | 6         | 75         | 50         |           | 125         |
| 9                          | CSE-413 | Seminar                       |             | 2        |           | 2         |            | 50         |           | 50          |
| 10                         | CSE-415 | Training Viva                 |             |          |           |           |            | 75         |           |             |
|                            |         | <b>Total</b>                  | <b>17</b>   | <b>7</b> | <b>11</b> | <b>35</b> | <b>500</b> | <b>425</b> | <b>75</b> | <b>1000</b> |

**Department Elective-II (in 7th Sem)**

1. CSE-441 Software Project Management
2. CSE-443 Embedded System Design
3. CSE-445 Artificial Intelligence
4. CSE-447 Image Processing

**Department Elective-III (in 7th Sem)**

1. CSE-471 Unix & Linux Programming
2. CSE-473 Security & Cryptography

## ARTIFICIAL INTELLIGENCE

CSE-445

(Departmental Elective II)

| L | T | P |
|---|---|---|
| 3 | 1 | - |

**Theory: 75 Marks**  
**Sessional: 50 Marks**

### Unit-1

**Introduction:** Definition of Artificial Intelligence (AI), Evolution of Computing, History of AI, Classical Romantic and modern period, subject area, Architecture of AI machines, logic family, classification of logic.

**Production System:** Production rules, the working memory, Recognize-act cycle, conflict resolution strategies, refractoriness, specify alternative approach for conflict resolution by Meta rules, Architecture of production system.

### Unit-2

**Propositional Logic:** Proposition, tautologies, Theorem proving, Semantic method of theorem proving, forward chaining, backward chaining standard theorems, method of substitution. Theorem proving Wang's algorithm.

**Predicate Logic:** Alphabet of first order Logic(FOL), predicate, well formed formula, clause form, algorithm for writing sentence into clause form, Unification of predicates, unification algorithm, resolution Robinson's interface rule, Scene interpretation using predicate logic.

### Unit-3

**Default and Non monotonic Logic:** Axiomatic theory, Monotonicity, non-atomic reasoning using McDermott's NML-I, problems with NML-I, reasoning with NML-II, Case study of Truth Maintenance system(TMS), neural network fundamentals.

**Imprecision and Uncertainty:** Definition, Probabilistic techniques, Certainty factor based reasoning, conditional probability. Medical diagnosis problem, Bay's theorem and its limitations, Bayesian belief network, propagation of belief, Dempster-Shafer theory of uncertainty management, belief interval, Fuzzy relation, inverse Fuzzy relations, Fuzzy post inverse, Fuzzy Inversion.

### Unit-4

**Intelligent Search Techniques:** Heuristic function, AND-OR graph, OR Graph, Heuristic search, A\* algorithm and examples.

**Logic Programming with Prolog:** Logic program, Horn clause, program for scene interpretation, unification of goals, SLD resolution, SLD tree, flow of satisfaction, controlling back tracking using CUT, command use of CUT, implementation of backtracking using stack, risk of using cuts, fail predicate, application of cut-fail combination, replacing cut-fail by not.

**Note:** - There will be 8 questions in all. Two questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### Books

1. Konar: Artificial Intelligence and Soft Computing – Behavioral and Cognitive Modeling of Human Brain, CRC Press, USA
2. E. Charniak and D.McDermott: Introductin to Artificial Intelligence, Addison Wesley Longman.  
Departmental Elective-111

## UNIX & LINUX PROGRAMMING

CSE-471

|   |   |   |
|---|---|---|
| L | T | P |
| 3 | 1 | - |

|            |         |
|------------|---------|
| Theory:    | 75Marks |
| Sessional: | 25Marks |

### Unit-1

Linux Startup: User accounts, Accessing Linux – starting and shutting processer, Logging in and Loogging out, Command line, simple commands: Shell Programming: Unix file system: Linux/unix file, i-nodes and structure and file system related commands, Shell, as command processer, shell variables, creating command substitution, scripts, function, conditionals, loops, customizing environment

### Unit-2

Regular Expressions and Filter: Introducing regular expressions patterns, syntax, character classes, quantifiers, introduction to egrep, sed, programming with awk and perl.

### Unit-3

The C Environment: The C compiler, vi editor, options, managing projects, memory management, use of makefile, dependency calculations, memory management – dynamic and static memory, building and using static and dynamic libraries, using ldd, soname, dymame loader, debugging with gdb

### Unit-4

Processes in linx: Processes, starting and stopping processes, initialization processes, rc and init file, job control – at, batch, cron, time, network file, security, privileges, authentication, password administrator, archiving, Signal and Signal handler, Linux I/O system.

Note:- There will be 8 questions in all. Questions will be set from each unit. Student are required to attempt five questions selecting at least one question from each unit.

### Books.

1. John Goerzen: Linux programming Bible, IDG Book, New Delhi, 2000.
2. Sumitabha Das: Your Unix – The Ultimate Guide, TMH, 2000.
3. Mathew: Professional Linux Programming, vol.1 & 2, Worx-Shroff, 2001.
4. Welsh & Kaufmann: Running Linux, O'Reiley & Associates, 2000

## COMPILER DESIGN

CSE-401

L T P

4 1 -

Theory: 100 Marks

Sessional: 25 Marks

### Unit – 1

Assembler, linkers, loaders, compilers and translators, the structure of a compiler, different states in the construction of a compiler, Design of lexical analyzer, Basic Parsing Techniques, Parsers, shift-reduce parsing, operator-precedence parsing, top-down parsing predictive parsers, L.R. Parsers, the canonical collection of L.R. Parsing tables, Constructing LALR parsing ablest implementation of L R Parsing tables.

### Unit – 2

**Syntax-Directed Translation:** Syntax-directed translation schemes, implementation of syntax directed translators, intermediate code, postfix notation, paces trees and syntax tree, three address code, quadruples, and triples, translation of assignment statements. Boolean expressions, control statements.

Symbol labels

The contents of symbol labels data structures for symbol tables representing scope information.

### Unit – 3

**Run Time Storage Administration:** Implementation of a simple stack allocation scheme, implementation of block structured languages, storage allocation in block structured language

Error Detection and Recovery: Error, Lexical-phase errors, syntactic-phase errors, semantic errors.

### Unit – 4

**Code Optimization:** The principle sources of optimization, loop optimization, the DAG representation of basic blocks, value number and algebraic laws, global dataflow analysis.

Code Generation: Object programs, problems in code generation, a machine model, a single code generator, register allocation and assignment, code generation form DAGs, peephole optimization.

**Note:** - There will be 8 questions in all. Two questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

Retrieving the contents of an HTML format, retrieving a query string, working with Beans, Cookies, creating and Reading Cookies. Using Application Objects and Events.

XML: Relationship between HTML, SGML and XML, Basic XML, Valid documents, ways to use XML,XML for data files, embedding XML into HTML documents. Converting XML, the future of XML.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### BOOKS

1. Thomas A Powell, HTML The Complete Reference, Tata McGraw Hill Publications.
2. SCSEt Guelich, Shishir Gundavaram, Gunther Birzneik; CGI Programming with PERL 2/e, O' Reilly.

3. Doug Tidwell, James Snell, Pavel Kulchenko; Programming web services with SOAP, O' Reilly
4. Pardi, XML in Action, Web Technology, PHI
5. Yong, XML step by step, PHI
6. Aaron, Weiss, Rebecca Taply, Kim Daniels, Stuvén Mulder, Jeff Kaneshki, Web Authoring Desk reference, Tecmedia publications

## WEB ENGINEERING

### CSE-403

| L | T | P |
|---|---|---|
| 3 | 1 | - |

**Theory: 75 Marks**  
**Sessional: 25 Marks**

#### Unit-1

**Information Architecture:** The role of information Architect, Collaboration and Communication, Organizing Information, organizational challenges, organizing web sites and intranets, Creating cohesive organization system designing navigation systems, types of navigation system, integrated navigation elements, designing elegant navigation systems, Searching, systems, Searching your web site, designing the search interface, indexing the right stuff, To search or not to search grouping content, conceptual design, high level Architecture Blueprint, architectural Page Mockups, Design Sketches.

#### Unit-2

**Dynamic HTML and Web Designing:** HTML Basic concepts, Good web design, process of web publishing phases of site development, STRUCTURE OF HTML documents. HTML elements- core attributes, Language attributes, Core Events, Block level events. Text level events, Linking basics, Linking in HTML images and Anchors, Anchor Attributes image maps, Semantic linking meta information, image preliminaries, image download issues, images and buttons, introduction to layout: Backgrounds, color and text, fonts layout with tables. Advanced layout: Frames and layers, HTML and other media types. Audio support in browsers, video support, other binary formats style sheets, positioning with style sheets. Basic interactivity and HTML: FORMS, form control, new and emerging form elements.

#### Unit-3

**CGI Using PERL:** Introduction to CGI, Alternative technologies, the Hypertext Transport protocol, URLs, HTTP, Browser requests, Server Responses, Proxies, and Content Negotiation. The common Gateway interface, The CGI Environment, Environment variables, CGI Output, forms and CGI, Sending Data to the server form Tags, Decoding form input, Architectural Guidelines, Coding Guidelines, Efficiency and optimization.

#### Unit-4

**Java Server Pages:** Basic, integrating scripts in JSPs, JSP Objects and Components, configuring and troubleshooting, JSP: request and Response objects, retrieving the contents of HTML format, retrieving a query string, Working with Beans, Cookies, creating and Reading Cookies. Using Application Objects and Events.

**XML:** Relationship between HTML, SGML and XML, Basic XML, Valid documents ways to use XML, XML for data files, embedding XML into HTML documents. Converting XML to HTML for Display, Displaying XML using CSS and XSL rewriting HTML as XML, the future of XML

## STATISTICAL MODELS FOR COMPUTER SCIENCE

CSE-405

L T P  
4 1 -

Theory: 100 Marks  
Sessional: 25 Marks

### Unit-1

Probability Model, Sample Space, Events, their algebra, graphical methods of representing events, Probability Axioms and their applications, Condition probability, Independent of Events, Bayes' Rule & Bernoulli Trails.

### Unit-2

Random variables, and their events spaces, Probability mass function, Distribution functions, some discrete distributions ( Bernoulli, Binomial, Geometric, Negative Binomial, poisson, Hyper geometric and Uniform), Probability Generation Function, Discrete random vectors, Continuous random variables: some continuous distributions (Exponential, Hyperexponential, Erlang, Gamma, Normal), Functions of random variables, jointly distributed random variables. Expectation, Expectation of functions of more than one random variable, Brief introduction to Conditional pmf: pdf and expectation, Moments and transforms of some distributions ( Uniform, Bernoulli, Binomial, Geometric, Poisson, Exponential, Gamma, Normal), Computation of mean time to failure.

### Unit-3

Stochastic Processes, Classification of stochastic processes, the Bernoulli process, The Poisson Processes, renewal process, renewal model of program behavior.

### Unit-4

Markov Chains, Computation of n-step transition probabilities, State classification and limiting distributions, Distributions of times between state changes, Irreducible finite chains with aperiodic states. M/G/I queuing system, Discrete parameter Birth-Death processes, Analysis of program execution time, Continuous parameter Markov Chains, Birth-Death processes with special cases, Non-Birth-Death processes.

Notes:- There will be 8 questions in all. Two Questions will be set from each unit. Students are required to attempt five questions selecting at least one question from each unit.

### BOOKS

1. K.S. Trivedi, Probability, Statistics with Reliability, Queuing and Computer Science Applications, PHI, 2001,
2. J.F. Hayes, Modeling of Computer Communication Networks, Khanna Publishing, Delhi.

CSE-407

## Linux Lab (7<sup>th</sup> Sem.)

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| -        | -        | *1+2     |

|                          |                  |
|--------------------------|------------------|
| <b>Sectional Work:</b>   | <b>50 Marks</b>  |
| <b>Practical:</b>        | <b>50 Marks</b>  |
| <b>Total:</b>            | <b>100 Marks</b> |
| <b>Duration of Exam:</b> | <b>3 Hrs.</b>    |

### List of Experiments

1. Familiarize with Unix/Linux logging/logout and simple commands.
2. Familiarize with VI editor.
3. Using Bash shell develop simple shell programs.
4. Develop advanced shell programs using grep. Fgrep & egrep.
5. Compile and debug various C programs using different options.
6. Learning of installation and up gradation of Linux operating system.
7. Install, Linux on a PC having some other previously installed operating system. All OS's should be usable.
8. As supervisor create and maintain user accounts, learn package installation, taking backups, creation of scripts for file and user management, creation of startup and shutdown scripts using at. Cron etc.

CSE-409

## Web Engineering Lab. (7<sup>th</sup> Sem)

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| -        | -        | 3        |

|                          |                 |
|--------------------------|-----------------|
| <b>Sectional Work:</b>   | <b>25 Marks</b> |
| <b>Examination:</b>      | <b>25 Marks</b> |
| <b>Total:</b>            | <b>50 Marks</b> |
| <b>Duration of Exam:</b> | <b>3 Hrs.</b>   |

### List of Experiments

1. Check out the storyboard and design of Diary food Lmt. As the name reflects your site diary products and aims to opening an online store.
2. Create your own page with your favorite hobbies.
3. Create a menu or a table of content web page each menu items or section of table of content should load a different web page.
4. Create a website of your college.
5. Create a Frameset that is divided into three sections. The Frameset should have three zones.
  - The topmost section
  - The middle section
  - The lower section
6. Create a web page which displays map of your country Link, each city/state on the image map, such that the respective HTML page of the city/state is displayed when the user select an area.
7. Incorporate a quest book and use java script to built validation into form.
8. Use style-sheet to modify the following:
  - a. Change background to modify the color.
  - b. Change font type and color.
  - c. Align text.
9. To design a web page using inline Frame.
10. Write a program using XML to display the data.

**KURUKSHETRA UNIVERSITY KURUKSHETRA**  
**SCHEME OF STUDIES & EXAMINATIONS**  
**B.Tech. 4th YEAR (SEMESTER-VIII)**

| Scheme of Computer 8th sem |         |                          |             |          |           |           |            |            |            |             |
|----------------------------|---------|--------------------------|-------------|----------|-----------|-----------|------------|------------|------------|-------------|
| S. No.                     | Code    | Subject Name             | Weekly Load |          |           |           | Exam. Sch. |            |            |             |
|                            |         |                          | L           | T        | P/D       | Tot       | Th         | Ses        | Pr         | T           |
| 1                          | ****    | Departmental Elective-IV | 3           | 1        |           | 4         | 75         | 50         |            | 125         |
| 2                          | *****   | Departmental Elective-V  | 3           | 1        |           | 4         | 75         | 50         |            | 125         |
| 3                          | CSE-402 | Neural N/w & F.L.        | 4           | 1        |           | 5         | 100        | 50         |            | 150         |
| 4                          | CSE-404 | Interactive C.G.         | 4           | 1        |           | 5         | 100        | 25         |            | 125         |
| 5                          | CSE-406 | Neural N/w (Pr.)         |             |          | 3         | 3         |            | 50         | 50         | 100         |
| 6                          | CSE-408 | Major Project            |             |          | 12        | 12        |            | 100        | 100        | 200         |
| 7                          | CSE-410 | Seminar                  |             | 2        |           | 2         |            | 50         |            | 50          |
| 8                          | CSE-412 | Comprehensive Viva-Voce  |             |          |           |           |            | 50         |            | 50          |
| 9                          | CSE-414 | G.F.P.A.                 |             |          |           |           |            |            | 75         | 75          |
|                            |         | <b>Total</b>             | <b>14</b>   | <b>6</b> | <b>15</b> | <b>35</b> | <b>350</b> | <b>425</b> | <b>225</b> | <b>1000</b> |

**Department Elective-IV ( in 8th Sem)**

1. CSE-440 Distributed Operating System
2. CSE-442 Software Quality Models & Testing
3. CSE-444 Bioinformatics
4. CSE-446 Expert Systems
5. CSE-448 Real Time System & Software
6. CSE-450 Software Verification, Validation & Testing

**Department Elective-IV ( in 8th Sem)**

1. CSE-472 Object Oriented Software Engineering
2. CSE-474 Simulation & Modeling
3. CSE-476 Data Warehousing & Data Mining

## DISTRIBUTED OPERATING SYSTEMS

(Departmental Elective-IV)

CSE-440

| L | T | P |
|---|---|---|
| 3 | 1 | - |

Theory: 75 Marks  
Sessional: 50 Marks

### Unit-1

Architecture of distributed operating system: Introduction, motivation, system architecture type, issues in distributed operating system, communication primitive.

### Unit-2

Distributed mutual exclusion: Introduction, classification, preliminaries, simple solution, non token based algorithm, Lamport algorithm, Ricart algorithm, Mackawa's algorithm, A generalized non token based algorithm, Token based algorithm, Broadcast algorithm, Heuristic algorithm, Tree based algorithm, comparative performance analysis.

### Unit-3

Distributed deadlock detection: Introduction, deadlock handling, strategies, issues in deadlock detection and resolution, Control organization, centralized, distributed and hierarchical detection algorithm.

### Unit-4

Distributed file system: Introduction, architecture mechanism for building, design issues, log structured file system. Distributed scheduling: Introduction, motivation, issues in load distribution, component of load algorithm, stabilizing, load distribution algorithm, performance comparison, selection of a suitable load sharing algorithm, requirement for load distribution, task migration, issues in task migration.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit. Student is required to attempt five questions selecting at least one question from each unit.

### BOOKS:

1. Mukesh Singhal & N.G. Shivaratri: Advance Concepts in Operating System
2. A.S.Tanennbaum: Modern Operating System, PHI
3. A Silberschatz, P. Galvin, G. Gahne: Applied Operating System Concepts, Wiley

CSE-476

**DATA WAREHOUSING AND DATA MINING**  
**(Departmental Elective-V)**

**L**     **T**     **P**  
**3**     **1**     **-**

**Theory: 75 Marks**  
**Practical: 25 Marks**

**UNIT- 1**

Data Warehousing:: Definition, Scope, Practical implications, Structures and functions.

Data Mining: Process, Technologies and Rules, Platform tools and tool characteristics, operational vs. information systems.

**UNIT- 2**

Types of data warehouses: Host based, single stage, LAN based, Multistage, stationary distributed and virtual data-warehouses.

**UNIT-3**

Data Warehouses architecture: Metadata, operational data and operational data bases. Data warehouse architecture model, 2-tier, 3-tier and 4-tier data warehouses.

OLAP and DSS support in data warehouses.

**UNIT- 4**

Data Mining: Knowledge discovery through statistical techniques, Knowledge discovery through neural networks, Fuzzy tech. and genetic algorithms.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit.  
Students are required to attempt five questions selecting at least one question from each unit.

**Books**

1. "Building the Data Warehouse", W.H.Inmon, John Wiley & sons.
2. "Developing the Data Warehouse", W.H.Inmon, C.Kelly, John Wiley & sons.
3. "Managing the Data Warehouse", W.H.Inmon, C.L.Gassey, John Wiley & sons.
4. "Advances in knowledge discovery & Data Mining", Fayyad, Usama M. et. al., MIT Press.
5. "Data Mining", A.K. Pujari; Longman Publisher

## NEURAL NETWORK & FUZZY LOGIC

CSE-402

L T P  
4 1 -

Theory: 100 Marks  
Sessional: 50 Marks

### Unit 1

**Introduction**:- Concepts of neural networks, Characteristics of neural networks, Historical Perspective, Applications of neural networks.

**Fundamental of Neural Networks**: The biological prototype, Neuron concept, Single Layer neural network, Multi layer neural networks, terminology, Notation and representation of neural networks, Training of artificial neural networks.

Representation of perceptron and issues, perceptron learning and training, Classification, linear separability.

### Unit 2

**Hopfield nets**: Structure, training and applications, Stability.

**Backpropagation**:- Concept, Applications and back propagation training algorithm.

Counter Propagation Networks: Kohonen Network, Grossberg Layer & Training, Applications of counter propagation, Image classification.

### Unit 3

**Bi-directional Associative memories**: Structure, retrieving a stored association, encoding associations, memory capacity.

**ART**: ART architecture, ART classification operation, ART implementation and characteristics of ART.

Image compression using ART.

### UNIT 4

**Optical Neural Network**: Vector multipliers Hopfield net using Electro optical matrix multipliers, Holographic correlator, Optical Hopfield net using volume holograms.

**The Cognitrons and Neocognitrons**: Their structure and training.

**Genetic Algorithms**: Elements, A simple genetic algorithm, Working of genetic algorithm evolving neural networks.

**Note**:- There will be eight question in all. Two question will be set from each unit. Students are required to attempt five questions selecting at least one question for each unit.

Books:-

1. Li Min Fu, "Neural Networks in Computer intelligence", McGrawHill Inc.
2. Philip D. Wasserman, "Neural Computing Theory & practice", ANZA research Inc.
3. Melaine Mitchell, "An introduction to genetic algorithm", PHI.
4. M.H. Hassun, "fundamental of artificial neural networks", PHI.

## INTERACTIVE COMPUTER GRAPHICS

### CSE-404

| L | T | P |
|---|---|---|
| 4 | 1 | - |

**Theory:** 100 Marks

**Sessionals:** 25 Marks

### UNIT- 1

Display Devices: Line and point plotting systems: Raster, Vector, Pixel and point plotters, Continual refresh and storage displays, Digital frame buffer, Plasma panel display. Very high resolution devices. High- speed drawing. Display processors. Character generators, Color Display techniques (shadow mask and penetration CRT, color look-up tables, analog false colors, hard copy color printers).

### UNIT- 2

Display Description: Screen co-ordinates, user co-ordinates, Graphical data structures (compressed incremental list, vector list, use of homogeneous coordinates); Display code generation Graphical functions: the view algorithm. Two- dimensional transformation, Line drawing. Circle drawing algorithm.

### UNIT- 3

Interactive graphics: Pointing and positing devices (cursor, light pen, digitizing tablet, the mouse, track balls). Interactive graphical techniques. Positioning (Elastic or Rubber Bank lines, Linking, Zooming, panning clipping, windowing, scissoring). Mouse programming.

### UNIT- 4

3-D Graphics: Wire-frame, perspective display, Perspective depth, projective transformations. Hidden line and surface elimination. Transparent solids, shading. Two dimensional Transformations. 3-dimesional Transformations. Interactive Graphical Techniques GUI.

**Note:** - There will be 8 questions in all. Two Questions will be set from each unit. Student is required to attempt five questions selecting at least one question from each unit.

### Books

1. Giloi, W.K., Interactive Computer Graphics, Prentice Hall
2. Newman, W., Sproul, R.F., Principles of Interactive Computer Graphics, McGraw Hill
3. Harrington, S., Computer Graphics: A Programming Approach, Tata McGraw Hill
4. Hearn, D.Basker, Computer Graphics, Prentice Hall
5. Kelley Bootle, Mastering Turbo C
6. Roggers, D.F., Procedural Elements for Computer Graphics, McGraw Hill
7. Foley, J.D., Van Dam A, Fundamentals of Interactive Computer Graphics, Addison Wesley.
8. Tosijasu, L.K. Computer Graphics, Springer Verilag.

CSE-406-E

## Neural Networks. (8<sup>th</sup> Sem)

|          |          |          |
|----------|----------|----------|
| <b>L</b> | <b>T</b> | <b>P</b> |
| -        | -        | <b>3</b> |

|                          |                  |
|--------------------------|------------------|
| <b>Sessional Work:</b>   | <b>50 Marks</b>  |
| <b>Exam:</b>             | <b>50 Marks</b>  |
| <b>Total:</b>            | <b>100 Marks</b> |
| <b>Duration of Exam:</b> | <b>3 Hrs.</b>    |

### List of Experiment

1. NN for AND, OR gate.
2. Perceptions to classify odd and even numbers.
3. NN for alphabet recognition using back propagation.
4. Hopfield network for recognizing patterns such as '+' and '-'.
5. NN for EXOR classification using Back propagation.
6. CPN for image classification.
7. Name and telephone no. recognition system.