SCHEME OF EXAMINATION AND INSTRUCTION FOR 1/4 B.TECH. w.e.f 2007-2008 (Semester System)

		Perioc we	ls per ek	Maximum Marks		Total
Code No	Subject	L/T	D/P	Sessional	Univer sity	Marks
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 101	Mathematics - I	3	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 102	Mathematics - II	3	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 103	Physics	3	-	30	70	100
CE/CSE/ECE/EEE/ EI/IT/ME - 104	Chemistry	3	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 105	Technical English Communication Skills	3	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 106	Computer Programming with C	3	-	30	70	100
CE/CSE/ECE/EEE/ EI/IT/ME - 107	Engineering Mechanics	3+1	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 108	Engineering Graphics**	2+4	-	30	70	100
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 151	Physics Lab	-	3	25	50	75
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 152	Chemistry Lab*	-	3	25	50	75
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 153	Workshop Practice*	-	3	25	50	75
BT/CE/Ch.E/CSE/ECE/ EEE/EI/IT/ME - 154	Computer Programming with C Lab	-	3	25	50	75
	TOTAL	23+5	9	340	760	1100

I/IV B.TECH (ALL BRANCHES) - ANNUAL PATTERN (For I B.Tech. only) (except Chemical Engg. and Biotechnology)

* Common slot

** Two different question papers will be set for the University Examination. One question paper for CE, ME, EEE, Ch.E and BT branches and the University Examination will be conducted from 9.00 A.M. to 12.00 Noon. The second question paper will be set for ECE, EI, CSE & IT branches and the University exam will be conducted from 2 P.M. to 5 PM.

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	Periods per week		Maximu	Total Marks	
		L/T	D/P	Sessional	University	
CS/IT 211	Mathematics – III	4	-	30	70	100
CS/IT 212	Circuit Theory	4+1	-	30	70	100
CS/IT 213	Digital Logic Design	4	-	30	70	100
CS/IT 214	Object Oriented Programming	4	-	30	70	100
CS/IT 215	Discrete Mathematical Structures	4+1	-	30	70	100
CS/IT 216	Data Structures	4+1	-	30	70	100
CS/IT 251	OOPS Lab	-	3	25	50	75
CS/IT 252	Data Structures Lab (C)	-	3	25	50	75
CS/IT 253	Communication Skills Lab	-	3	25	50	75
	TOTAL	24+3	9	255	570	825

II / IV B.Tech., (SEMESTER – I)

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	s per ek	Maximu	Total Marks		
		L/T	D/P	Sessional	University	
CS/IT 221	Probability & Statistics	4+1	-	30	70	100
CS/IT 222	Environmental Studies	4	-	30	70	100
CS/IT 223	Electronic Devices & Circuits	4	-	30	70	100
CS/IT 224	Computer Organization	4+1	-	30	70	100
CS/IT 225	Microprocessors & Microcontrollers	4+1	-	30	70	100
CS/IT 226	Operating Systems	4	-	30	70	100
CS/IT 261	EDC Lab	-	3	25	50	75
CS/IT 262	Microprocessors & Microcontrollers Lab	-	3	25	50	75
CS/IT 263	Soft Skills Lab	-	3	25	50	75
	TOTAL	24+3	9	255	570	825

II / IV B.Tech., (SEMESTER - II)

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	Periods per week		Maximu	Total Marks	
		L/T	D/P	Sessional	University	
CS/IT 311	Professional Ethics & Human Values	4	-	30	70	100
CS/IT 312	Data Communications	4	-	30	70	100
CS/IT 313	Automata Theory & Formal Languages	4	-	30	70	100
CS/IT 314	Java Programming	4+1	-	30	70	100
CS/IT 315	Database Management Systems	4+1	-	30	70	100
IT 316	Design & Analysis of Algorithms	4+1	-	30	70	100
CS/IT 351	Java Programming Lab	-	3	25	50	75
CS/IT 352	RDBMS Lab	-	3	25	50	75
IT 353	Algorithms Lab	-	3	25	50	75
	TOTAL	24+3	9	255	570	825

III / IV B.Tech., (SEMESTER – I)

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	Perioc we	ls per ek	Maximu	m Marks	Total Marks
		L/T	D/P	Sessional	University	
CS/IT 321	Computer Networks	4	-	30	70	100
CS/IT 322	Compiler Design	4	-	30	70	100
CS/IT 323	Web Technologies	4+1	-	30	70	100
CS/IT 324	Software Engineering	4+1	-	30	70	100
IT 325	Advanced UNIX Programming	4+1	-	30	70	100
IT 326	Elective-I	4	-	30	70	100
CS/IT 361	Term Paper	-	3	50		50
CS/IT 362	Web Technologies Lab	-	3	25	50	75
IT 363	Advanced Unix Programming Lab	-	3	25	50	75
	TOTAL	24+3	9	280	520	800

III / IV B.Tech., (SEMESTER – II)

ELECTIVE-I:

- IT 326(A) Artificial Intelligence
- IT 326(B) Advanced DBMS IT 326(C) Operations Research
- IT 326(D) Real-time Systems
- IT 326(E) Soft Computing
- IT 326(F) Principles of Programming Languages

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	Periods wee	s per ek	Maximu	Total Marks	
		L/T	D/P	Sessional	University	
IT 411	E-Commerce & ERP	4	-	30	70	100
IT 412	Security in Computing	4	-	30	70	100
CS/IT 413	Object Oriented Analysis & Design	4+1	-	30	70	100
CS/IT 414	Enterprise Programming	4+1	-	30	70	100
IT 415	Elective – II	4+1	-	30	70	100
IT 416	Elective – III	4	-	30	70	100
CS/IT 451	SE Lab/Mini Project	-	3	25	50	75
CS/IT 452	Enterprise Programming Lab	-	3	25	50	75
IT 453	Elective-II Lab*	-	3	25	50	75
	TOTAL	24+3	9	255	570	825

IV / IV B.Tech., (SEMESTER – I)

One Elective is to be offered from each of these Pools.

<u>Elective – II</u> (* For the elective offered, the associated Lab is compulsory under IT 453)

- IT 415 (A) Open Source Systems
- IT 415 (B) Interactive CG
- IT 415 (C) .NET Technologies

IT 415 (D) Digital Signal Processing

- IT 415 (E) Multimedia Systems
- IT 415 (F) Software Testing Methodologies

<u>Elective – III</u>

- IT 416 (A) Total Quality Management
- IT 416 (B) Business Process Models
- IT 416 (C) Embedded Systems
- IT 416 (D) Bio-informatics
- IT 416 (E) VLSI Design
- IT 416 (F) Quantum Computing

SCHEME FOR INFORMATION TECHNOLOGY w.e.f 2007-2008 (Semester System)

Code No.	Subject	Periods per week		Maximur	Total Marks	
		L/T	D/P	Sessional	University	
IT 421	Distributed Systems	4+1	-	30	70	100
IT 422	Storage Area Networks	4+1	-	30	70	100
CS/IT 423	Data Engineering	4+1	-	30	70	100
CS/IT 424	Industrial Engineering & Management	4	-	30	70	100
IT 425	Elective – IV	4	-	30	70	100
CS/IT 461	Data Engineering Lab	-	3	25	50	75
IT 462	Project Work	-	9	50	100	150
	TOTAL	20+3	12	225	500	725

IV / IV B.Tech., (SEMESTER – II)

One Elective is to be offered from this Pool.

Elective IV

- IT 425 (A) Digital & Image Processing
- IT 425 (B) Mobile Computing
- IT 425 (C) Grid Computing
- IT 425 (D) Biometrics
- IT 425 (E) Natural Language Processing
- IT 425 (F) Mobile Ad hoc Networks

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 101: MATHEMATICS - I (Common to all Branches)

Lectures	:	3 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

Unit-l

Ordinary differential equations-Introduction, Linear and Bernoulli's equations, Exact equations, equations reducible to exact equations, Orthogonal trajectories, Linear Differential equations: Definition, Theorem, Operator D, Rules for finding the complementary function, Inverse operator, Rules for finding the particular integral, Working procedure to solve the equation, Newton's law of cooling, Heat flow, Rate of Decay of Radio-Active Materials.

Unit-II

Linear dependence of solutions, Method of variation of parameters, Equations reducible to linear equations, Cauchy's homogeneous linear equation, Legendre's linear equation Simultaneous linear equations with constant coefficients, Statistics: Method of least squares, Correlation, co-efficient of correlation (direct method only), lines of regression.

Unit-III

Laplace Transforms : Introduction, Transforms of elementary functions, Properties of Laplace Transforms, existence conditions, Transforms of derivatives, Integrals, multiplication by tⁿ, division by t, Evaluation of integrals by Laplace Transforms, Inverse transforms, convolution theorem, Application to Differential equations with constant coefficients, transforms of unit step function, unit impulse function, periodic function. Convolution Theorem, Application to ordinary differential equations

Unit-IV

Introduction and Euler's formulae, Conditions for a Fourier expansion, Functions having points of discontinuity, Change of interval, Even and Odd functions, Half range series Typical wave forms and Parseval's formulae, Complex form of the Fourier series Practical harmonic analysis

<u>Text Books</u>: 1). Higher Engineering Mathematics by B.S. Grewal, Khanna publishers, 39th edition.

Reference Books: 1]. Advanced Engineering Mathematics by kreyszig.

2]. A textbook of Engineering Mathematics by N.P. Bali

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 102: MATHEMATICS - II (Common to all Branches)

Lectures	:	3 periods/week	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

Unit-l

Matrices:

Rank of a matrix, vectors, Elementary transformations, Solution of linear system of equations, Consistency of linear system of equations, System of linear homogeneous equations, Linear transformations, Characteristic equations, Properties of eigen values, Cayley- Hamilton theorem (without proof), Reduction to diagonal form reduction of Quadratic forms to canonical form, Nature of a quadratic form, Complex matrices.

Unit-II

Differential Calculus:

Rolle's Theorem (without proof), Lagrange's Mean value theorem (without proof), Taylor's theorem (without proof), Maclaurin's series, Maxima and Minima of functions of two variables, Lagrange's method of undetermined multipliers.

Unit-III

Multiple Integrals and Vector Calculus:

Double integrals, Change of order of integration, Double integrals in polar coordinates, Area enclosed by plane curves, Evaluation of triple integrals, Volume of solids, Change of variables.

Vector Calculus:

Scalar and vector point functions, Del applied to scalar point functions. Gradient

Unit-IV

Vector Calculus:

Del applied to vector point functions, Physical interpretation of divergence, Del applied twice to point functions, Del applied to products of point functions, Integration of vectors, Line integral, Surfaces, Green's theorem in the plane (without proof), Stoke's theorem (without proof), Volume integral, Gauss divergence Theorem (without proof), Cylindrical Coordinates, Spherical polar coordinates.

<u>Text Books</u>: [1] Higher Engineering Mathematics by B.S.Grewal Khanna publishers, 39thedition.

Reference Books: 1] A textbook of Engineering Mathematics by N.P. Bali

2] Advanced Engineering Mathematics by Erwin Keyszing John willy and sons.3] Differential Calculus by Shanti Nayaran

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 103: <u>PHYSICS</u> (Common to all Branches)

			,		
Lectures	••	3 periods/week	Sessional Marks	•••	30
University Exam	•••	3 hours	University Examination Marks	•••	70

UNIT - 1 Ultrasonics & Optics :

(20 Periods)

Ultrasonics- Production of Ultrasonics by Magnetostriction & Piezoelectric oscillator methods, Detection of Ultrasonics by Kundt's tube and acoustic grating method, applications of Ultrasonics in engineering & medicine. Lissajous' figures for time periods with Ratios 1:1 and 1:2, applications of Lissajous' figures.

Optics: Superposition principle, Stokes principle (Phase change on reflection) - Interference in thin films due to reflected light(cosine law) -Michelson's interferometer principle, construction, working and applications (Determination of wave length of monochromatic source & for resolution of two closely lying wavelengths).

Diffraction: Fraunhoffer diffraction due to a single slit, Plane diffraction grating, resolving power of a grating using Rayleigh's criterion. *Polarization*: double refraction, Nicol prism, quarter wave plate, Production and detection of circular and elliptical polarizations (qualitative), Optical activity, Electro-optic and Magneto-optic effects (Kerr & Faraday effects).

UNIT -II Electicity & Electromagnetism:

(20 Periods)

(18 Periods)

Gauss's law in electricity (statement and proof) and its applications: Coulomb's law from Gauss law, line of charge, non-conducting infinite sheet, Charged non-conducting sphere.

Circulating charges and Cyclotron principle& working, Hall effect, Biot-Savart's law- B for a long wire and circular loop, Faraday's law of induction- Lenz's law- induced electric fields ,Gauss' law for magnetism ,Inductance, Energy storage in a magnetic field, Electromagnetic oscillations(quantitative),Displacement current, Maxwell's equations (Qualitative treatment),Electromagnetic waves equation and velocity, A.C. Circuit containing series LCR circuit (Resonance condition).

UNIT -III Modern Physics

Planck's theory of black body radiation, Dual nature of light, Compton effect, Matter waves - de Broglie's concept of matter waves - Davisson and Germer experiment - Heisenberg's uncertainty principle and applications(non existence of electron in nucleus, finite width of spectral lines). One dimensional time independent Schrodinger's wave equation - Physical significance of wave function - Particle in a box(one dimension)- Radio Isotopes-applications in medicine and industry, Qualitative treatment (without derivation) of Fermi -Dirac distribution function and Fermi-energy level concept in semiconductors.

UNIT - IV Advanced Physics

(17Periods)

Lasers: -Spontaneous emission -stimulated emission - Population inversion - Solid State (Ruby) laser - Gas (He-Ne) laser - Semiconductor(Ga-As) laser - Applications of lasers. Holography Principle, Recording , reproduction and applications.

Optical fibers : Structure of optical fiber, types of optical fibers, Numerical aperture - fiber optics in communication and its advantages

Super conductivity: First experiment, critical parameters(T_c , H_c , I_c) Meissner effect, types of superconductors, Applications of Superconductors.

Optoelectronic devices: Qualitative treatments of -- Photo diode, LED , LCD and Solar cell and its applications.

Nano Technology (Basic concepts only) and its applications.

Text Books

- 1. Physics Part I and II Halliday and Resinick.
- 2. Engineering physics Gaur & Gupta

Reference Books

- 1 Physics for engineers M.R.Srinivasan.
- 2 Engineering physics M.Arumugam.
- 3 Modern Engineering Physics A.S Vasudeva

CE/CSE/ECE/EEE/EI/IT/ME - 104 : <u>CHEMISTRY</u> (Common to all branches except Chemical Engineering and Bio-Tech)

Lectures		3 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	:	70

<u>UNIT-I</u>

(19 Periods)

WATER TECHNOLOGY: Drinking Water quality parameter, WHO guidelines, Hardness units and determination by EDTA method, water treatment for drinking purpose, sedimentation, coagulation, filtration, various methods of chlorination, breakpoint chlorination.

Water treatment for industrial purpose: Boiler troubles, scales, sludges, caustic embrittlement and boiler corrosion- causes and prevention, Lime Soda process, softening by ion exchange process (related problems), Desalination of brackish water by electro dialysis and reverse osmosis.

<u>COMPOSITES:</u> Classification and Properties of composite materials, Mechanism of reinforcement in composites.

<u>UNIT-II</u>

(18 Periods)

POLYMERS:

Monomer functionality, degree of polymerization, classification of polymerizationaddition, condensation and co polymerization, mechanism of free radical polymerization.

<u>Classification of plastics</u>- Thermoplastic and thermosetting resins, chemistry of synthesis of Bakelite, urea formaldehyde and polyesters. Compounding of plastics. Conducting polymers, polytiophene, mechanism of conduction, examples and applications, polymers as optical fibers- Application of polymers in biomedical devices and electronics.

Natural Rubber- drawbacks of natural rubber- vulcanization.

Synthetic rubbers- Buna-S and Buna-N and polyurethane rubber

<u>Materials used in information Technology</u>: Liquid crystals, cellulose acetate, ZnO, CdS, Silicon, Germanium

<u>UNIT-III</u>

(19 Periods)

<u>Phase Rule</u>: Statement and explanation of the terms involved, one component water system, condensed phase rule- construction of phase diagram by thermal analysis, simple eutectic system (Pb-Ag system only).

<u>Electrochemical Energy Systems</u>: Types of electrochemical energy systems, electrochemistry of primary batteries (Weston Cadmium Standard cell), Secondary cells(Lead Acid cell, Ni-Cd cell), Lithium batteries and their advantages.

<u>Fuels</u>: Classification of fuels, calorific value- determination. Coal- Ranking and analysis, carbonization of coal, coal-tar products, metallurgical coke, classification of petroleum-fractional distillations, cracking, reforming, composition and uses of petrol- diesel, coal gas, natural gas, producer gas, LPG- Bio gas.

<u>UNIT-IV</u>

(19 Periods)

<u>Corrosion and its control</u>: Introduction, electrochemical theory of corrosion, corrosion due to dissimilar metals, galvanic series, corrosion due to differential aeration cells, Types of corrosion: Pitting, Stress corrosion, cracking and microbiological corrosion, Factors affecting corrosion: oxidizers, pH, over voltage and temperature.

Protection methods: Cathodic protection, (Impressed current and sacrificial anode) anodic protection, corrosion inhibitors- types and mechanism of inhibition, metallic coatings by electroplating.

Lubricants:

Role of lubricants in reducing wear and friction, Mechanism and types of lubrication. Classification, properties and selection of lubricants, Additives

Text Books recommended:

- 1. Engineering Chemistry, P.C. Jain, Dhanpat Rai and Sons, New Delhi
- 2. A Text Book of Engineering Chemistry, S.S. Dara, 10th Edition, S.Chand and Co.
- 3. Essentials of Physical Chemistry, B.S.Bahl and G.D. Tuli
- 4. Principles of Polymer Science, P.Bahadur and N.V. Sastry, Narora Publishing House

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME: - 105 TECHNICAL ENGLISH COMMUNICATION SKILLS

Lectures		3 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

<u>Course objectives</u>: The areas of technical communication assay to make learners linguistically aware and communicatively competent. Special attention has been paid to the contemporary tests on language and industrial needs keeping in mind the current societal demands.

<u>UNIT-I</u>

<u>General Communication Skills</u>: This area exposes the learners to some standard varieties of linguistic communication.

- 1. Guided composition
 - a) Paragraph writing
 - b) Essay writing
 - c) Confusable words
- 2. Reading comprehension
- 3. Letter writing

UNIT-II

Technical Communication Skills: This area falls under English for specific purposes (ESP) which trains the learners in basic technical communication.

- 1. Report writing
- 2. Corporate information
- 3. Technical words

UNIT-III

Vocabulary and Basic Language Skills: This unit offers the learners some basic aspects of language like vocabulary, structure and usage which are common to many contemporary tests.

- 1. Basic word list A list of 500 words.
- 2. Idioms and phrases and their use.
- 3. Correction of sentences.
- 4. Analogies
- 5. One word substitutes
- 6. Antonyms & Synonyms

Textbooks:

- 1. Developing Language Skills: 1. (Foundation Books)
- 2. Objective English for Competitive Examinations (Third edition)
 - Hari Mohan Prasad
 - Uma Rani Sinha

(Tata McGraw Hill)

REFERENCE BOOKS

01. Effective Technical Communication - M.Ashraf Rizvi (Tata McGraw Hill) 02. English for Engineers Prepared by Regional Institute of English, South India, Bangalore (Foundation Books) 03. Cambridge Preparation Guide for TOEFL. 04. Dictionary of Technical Terms F.S.Cripsin (Oxford IBH) 05. Cambridge Advanced Learner's Dictionary 06. Cambridge Idioms Dictionary 07. Basic Correspondence & Report writing -Sharma (Tata McGraw Hill) 08. Business Correspondence and Report Writing - R.C.Sharma Krishna Mohan (Tata McGraw Hill) 09. Dictionary of Misspelled and Easily Confused Words -David Downing Deborah K.Williams (Tata McGraw Hill)

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BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME : - 106 COMPUTER PROGRAMMING WITH C

(Common to all Branches)

Lectures		3 periods/week	Sessional Marks	•••	30
University Exam	•••	3 hours	University Examination Marks	•••	70

<u>Unit - I</u>

Introduction:

ComputerFundamentals:Computer&it'sComponents,Hardware/Software,Algorithm,Charact erstics of algorithm, Flowchart ,Symbols are used in flowchart, history of C,Basic structure of C,C language features.

C Tokens: Character set, Variables, Keywords, Data types and sizes, Type qualifiers, Numeric Constants and their forms of representation, Character Constants, String Constants, Declarations and Initialization of variables.

Operators & Expressions: Arithmetic operators, and expressions, Type-conversion rules, Coercion, Assignment operators and expressions, Increment and decrement operator, Conditional operator, Statements, Preprocessor directives, Input/ Output functions and other library functions. Relational operators and expressions. Boolean operators and expressions.

Programming Exercises for Unit I:

C-Expressions for algebraic expressions, Evaluation of arithmetic and boolean expressions. Syntactic errors in a given program, Output of a given program, Values of variables at the end of execution of a program fragment, Filling the blanks in *a* given program, Computation of values using scientific and Engineering formulae, Finding the largest of three given numbers.

<u>Unit - II</u>

(20 Periods)

(18 Periods)

Conditional Statements: Blocks, If-Else statement, Else-If statement and Switch statement.

Iterative Statements: While loop, For loop, Do-While loop, Break, and continue.

Arrays: One - dimensional and character arrays, Two-dimensional numeric arrays.

Programming Exercises for Unit - II:

Computation of discount on different types of products with different ranges of discount Finding the type of triangle formed by the given sides, Computation of income-tax, Computation of Electricity bill, Conversion of lower case character to its upper case, Finding the class of an input character; Sum of the digits of a given number, Image of a given number, To find whether a given number is-prime; Fibonacci; abundant; perfect,Strong,Amstrong; deficient, Prime factors of a given number, Merging of lists, Transpose of a matrix, Product and sum of matrices, String processing-length of a string; comparison of strings; reversing a string; copying a string, Sorting of names using arrays, Graphics patterns, To print prime numbers and Fibonacci numbers in a given range, and Amicable numbers.

<u>Unit - III</u>

Functions: Function Definition, types of User Defined Functions, Parameter passing mechanisms, and simple recursion.

Scope & extent: Scope rules, Storage Classes, Multi-file compilation.

Pointers: Pointers Arithmetic, Character array of pointers, Dynamic memory allocation, array of Pointer, Pointer to arrays.

Programming Exercises for Unit - III:

Recursive Functions: factorial, GCD(Greatest Common Divisior), Fibonacci; To evaluate the pointer arithmetic expressions; An interactive program to perform Pointers & Functions - Insertion sort, Bubble sort, Linear search Binary search, Computation of Statistical parameters of a given list of numbers, Counting the number of characters, words and lines in a given text, Table of values of f (x,y) varying x and y; Using Storage Classes to implement the multifile compilation; implement the string operations using Dynamic memory allocation functions;

<u>Unit - IV</u>

(18 Periods)

Structures: Structures, Array of structures, structures within structures, Pointer to structures, self referential structures, Unions.

Files: File Handling functions, File error handling functions, Command-line arguments.

Programming Exercises for Unit - IV:

Operations on complex numbers, operations on rational number (p/q form), Matrix operations with size of the matrix as a structure; Frequency count of keywords in an input program, Sorting a list of birth records on name and date of birth using File handling functions, Student marks processing, Library records processing - sorting on name, author, Copy one file to another.

Text Book:

1. Programming with C (Schaum's Outlines) by Byron Gottfried, Tata Mcgraw-Hill.

Reference Books:

- 1. The C programming language by Kernighan B W and Ritchie O M, Prentice Hall.
- 2. Programming with C by K R Venugopal & Sudeep R Prasad, TMH.
- 3. 'C' Programming by K.Balaguruswamy, BPB
- 4. C Complete Reference, Herbert Sheildt, TMH

CE/CSE/ECE/EEE/EI/IT/ME - 107 ENGINEERING MECHANICS

(Common to all branches except Chemical Engg. & Biotechnology branches)

Lectures	:	3 periods/week, 1 Tutorial	Sessional Marks	 30
University Exam	:	3 hours	University Examination Marks	 70

<u>UNIT - I</u>

CONCURRENT FORCES IN A PLANE:

Principles of statics - composition and resolution of forces - equilibrium of concurrent forces in a plane - method of projections - Method of moments.

PARALLEL FORCES IN A PLANE:

Couple - general case of parallel forces in a plane - center of parallel forces and centre of gravity - Centroids of composite plane figures and curves.

<u>UNIT - II</u>

GENERAL CASE OF FORCES IN A PLANE:

Composition of forces in a plane – Equilibrium of forces in a plane – Plane trusses: methods of joints.

FRICTION: Static, kinetic, and limiting friction – angle of friction: Applications of static friction.

PRINCIPLE OF VIRTUAL WORK: Equilibrium of Ideal systems

<u>UNIT - III</u>

RECTILINEAR TRANSLATION:

Kinematics of rectilinear motion - principles of dynamics - differential equation of rectilinear motion - motion of a particle acted upon by a constant force - D'Alemberts principle - momentum and impulse - work and energy - ideal systems: conservation of energy - direct central impact

MOMENTS OF INERTIA OF PLANE FIGURES:

Moment of inertia of a plane figure with respect to an axis in its plane - Moment of Inertia with respect to an axis perpendicular to the plane of the figure - Parallel axis theorem.

<u>UNIT - IV</u>

CURVILINEAR TRANSLATION:

Kinematics of curvilinear motion - Differential equations of curvilinear motion - D'Alembert's principle in curvilinear motion - Work and Energy.

MOMENTS OF INERTIA OF MATERIAL BODIES:

Moment of inertia of a rigid body - Moment of inertia of a lamina - Moments of inertia of three - dimensional bodies.

ROTATION OF A RIGID BODY ABOUT A FIXED AXIS:

Kinematics of rotation - Equation of motion for a rigid body rotating about a fixed axis

TEXT BOOKS:

- 1. Engineering mechanics by S. Timoshenko and D. H. Young Mc Graw-Hill International edition (For concepts and symbolic problems)
- 2. Engineering mechanics statics and dynamics by A. K. Tayal Umesh publication, Delhi (For numerical problems using S.I. system of units)

REFERENCE BOOKS:

- 1. Vector mechanics for engineers statics and dynamics by Beer and Johnston, Tata Mc Graw-Hill publishing company, New Delhi
- 2. Engineering mechanics statics and dynamics by J. L. Meriam and L. Kraige

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME -108 ENGINEERING GRAPHICS (Common to all branches)

Lectures	:	2+4 periods/week	Sessional Marks	 30
University Exam	:	3 hours	University Examination Marks	70

NOTE : 1) Unit VI shall not be included in the university theory examination. This unit is only for internal assessment.

2) University Examination Question paper consists of FIVE questions, TWO questions from each unit with internal choice. (To be taught & examined in First angle projection)

UNIT I

GENERAL: Use of Drawing instruments, Lettering .-Single stroke letters, Dimensioning-Representation of various type lines. Geometrical Constructions. Representative fraction. (3+9)

CURVES : Curves used in Engineering practice - conic sections - general construction methods for ellipse, parabola and hyperbola. cycloidal curves - cycloid, epicycloid and hypocycloid; involute of circle and Archemedian spiral. (9+15)

UNIT II

METHOD OF PROJECTIONS: Principles of projection - First angle and third angle projection of points. Projection of straight lines. Traces of lines. (6+12)

PROJECTIONS OF PLANES : Projections of planes, projections on auxiliary planes. (4+8)

UNIT III

PROJECTIONS OF SOLIDS : Projections of Cubes, Prisms, Pyramids, Cylinders and Cones with varying positions. (4+8)

SECTIONS OF SOLIDS: Sections of Cubes, Prisms, Pyramids, cylinders and Cones, true shapes of sections. (Limited to the Section Planes perpendicular to one of the Principal Planes). (6+12)

UNIT IV

DEVELOPMENT OF SURFACES: Lateral development of cut sections of Cubes, Prisms, Pyramids, Cylinders and Cones. (4+8)

ISOMETRIC PROJECTIONS: Isometric Projection and conversion of Orthographic Projections into isometric views. (Treatment is limited to simple objects only). (4+8)

UNIT V

ORTHOGRAPHIC PROJECTIONS: Conversion of pictorial views into Orthographic views. (Treatment is limited to simple castings). (6+12)

UNIT VI (Demonstration only)

COMPUTER AIDED DRAFTING(Using any standard package): Setting up a drawing: starting, main menu (New, Open, Save, Save As etc.), Opening screen, error correction on screen, units, co-ordinate system, limits, grid, snap, ortho.

Tool bars: Draw tool bar, object snap tool bar, modify tool bar, dimension tool BarPRACTICE OF 2D DRAWINGS: Exercises of Orthographic views for simple solids using all commandsin various tool bars.(4+8)

TEXT BOOK:

1. Engineering Drawing by N.D. Bhatt & V.M. Panchal. (Charotar Publishing House, Anand).

2. AutoCAD 14 for Engineering Drawing Made Easy(Features AutoCAD 200) by P.Nageswara Rao REFERENCE BOOK:

1. Engineering Drawing by Prof.K.L.Narayana & Prof. R.K.Kannaiah.

2. Engineering Graphics with AutoCAD 2002 by James D. Bethune

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 151 : <u>PHYSICS LAB</u> (Common to all Branches)

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	:	3 hours	University Examination Marks	:	50

- 1. Compound Pendulum Measurement of g-value.
- 2. **Sonometer** Determination of unknown frequency of tuning fork and verification of laws of transverse vibrations of a stretched string
- 3. C.R.O Measurement of voltage, frequency and phase difference of an A.C. signal.
- 4. Torsional Pendulum Determination of Rigidity modulus/damping coefficient.
- 5. Newton's Rings Measurement of wavelength/Radius of curvature.
- 6. Dispersive Power Determination of Dispersive power of prism.
- 7. Diffraction Grating Determination of wavelength.
- 8. Air Wedge Measurement of thickness of given wire.
- 9. Field along the axis of a current carrying circular coil. Variation of intensity of magnetic field along the axis of circular coil.
- 10. L.C.R Resonance Characteristics.
- 11. Sensitive Galvanometer Figure of Merit.
- 12. Hall Effect Measurement of Hall potential and Carrier concentration
- 13. Carey Foster's bridge Measurement of temperature coefficient of resistance.
- 14. Platinum resistance thermometer Measurement of room temperature.
- 15. GM Counter Characteristics.
- 16. Photo Tube Characteristics of photo tube/determination of planks constant.
- 17. Determination of **band gap of semiconductors**.
- 18. Optical Measurements with laser.
- 19. Solar Cell Characteristics and Fill Factor determinations.
- 20. Fiber Optics Numerical Aperture Calculations.

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 152 : CHEMISTRY LABORATORY (Common to all Branches)

Lectures		3 periods/ alternate week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

LIST OF EXPERIMENTS

- Note: Minimum of twelve experiments have to be conducted out of the list of experiments given below.
 - Estimation of total alkalinity of water sample

 a. Standardization of HCl solution b. Estimation of alkalinity
 - 2. Determination of purity of washing soda
 - Estimation of Chlorides in water sample:
 a. Standardization of AgNO₃ solution b. Estimation of Chlorides
 - 4. Determination of Total Hardness of water sample:a. Standardization of EDTA solution b. Determination of Total Hardness
 - Estimation of Mohr's salt-permanganometry

 a. Standardization of KMnO₄ solution b. Estimation of Mohr's salt
 - 6. Estimation of Mohr's salt -Dichrometry a. Standardization of $K_2Cr_2O_7$ solution b. Estimation of Mohr's salt
 - 7. Analysis of soil sample:a. Estimation of Ca and Mgb. Estimation of Organic matter
 - Determination of available chlorine in bleaching powder-lodometry

 Standardization of Hypo solution b. Determination of Available chlorine
 - 9. Determination of lodine in lodized salt
 - 10. Determination of Iron (Ferrous and Ferric) in an iron ore by Permanganometry
 - 11. Determination of Zn using Potassium ferrocyanide
 - 12. Preparation of Phenol-formaldehyde resign
 - 13. Conductometric titration of an acid vs. base
 - 14. pH metric tritrations of an acid vs base

Demonstration Experiments:

- 15. Potentiometric titrations: Ferrous vs Dichromate
- 16. Spectrophotometry: Estimation of Mn/Fe

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 153 : WORKSHOP PRACTICE (Common to all branches)

Lectures	:	3 periods/ alternate week	Sessional Marks	:	25
University Exam	••	3 hours	University Examination Marks	••	50

1. Carpentry

To make the following jobs with hand tools

- a) Lap joint
- b) Lap Tee joint
- c) Dove tail joint
- d) Mortise & Tenon joint
- e) Gross-Lap joint

2. Welding using electric arc welding process / gas welding.

The following joints to be welded.

- a) Lap joint
- b) Tee joint
- c) Edge joint
- d) Butt joint
- e) Corner joint

3. Sheet metal operations with hand tools.

- a) Saw edge
- b) wired edge
- c) lap seam
- d) grooved seam
- f) funnel

4. House wiring

- a) To control one lamp by aspt switch
- b) To control two lamps by aspt switch
- c) To assemble a fluorescent lamp fitting
- d) Stair case wiring
- f) Go down wiring

BT/CE/Ch.E/CSE/ECE/EEE/EI/IT/ME - 154 : <u>COMPUTER PROGRAMMING WITH C LAB</u> (Common to all Branches)

Lectures	:	3 periods/ week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

List of programs (to be recorded)

1. A program for electricity bill taking different categories of users, different slabs in each category. (Using nested if else statement).

Domestic level Consumption As follows:						
Consumption Units	Rate of Charges(Rs.)					
0 - 200	0.50 per unit					
201 - 400	100 plus 0.65 per unit					
401 - 600	230 plus 0.80 per unit					
601 and above	390 plus 1.00 per unit					
Street level Consu	Imption As follows:					
Consumption Units	Rate of Charges(Rs.)					
0 - 50	0.50 per unit					
100 - 200	50 plus 0.6 per unit					
201 - 300	100 plus 0.70 per unit					
301 and above	200 plus 1.00 per unit					

- 2. Write a C program to evaluate the fllowing(using loops):
 - a. $1 + x^2/2! + x^4 / 4! +$ upto ten terms
 - b. $x + x^3/3! + x^5/5! + upto 7$ digit accuracy
 - c. $1+x+x^2/2! + x^3/3! + \dots$ upto n terms
 - d. Sum of 1 + 2+ 3 +.....+n
- 3. A menu driven program to check the number is:

i) Prime or not

- ii) Perfect or Abundant or deficient
- iii) Armstrong or not
- iv) Strong or not
- v) Fibonacci or not
- 4. A menu driven program to display statistical parameters (using one -dimensional array)i) Mean ii) Mode iii) Median iv) Variance v) Standard deviation
- 5. A menu driven program with options (using one -Dimensional array)
 - (i) To insert an element into array
 - (ii) To delete an element
 - (iii) To print elements
 - (iv) To print elements in reverse order
 - (v) To remove duplicates
- 6. A menu driven program with options (using two dimensional array)
 - (i) To compute A+B
 - (ii) To compute A x B
 - (iii) To find transpose of matrix A
 - (iv) To Check A=B

Where A and B are matrices. Conditions related to size to be tested

- 7. A menu driven program with options (using Two-dimensional Character arrays)
 - (i) To insert a student name
 - (ii) To delete a name
 - (iii) To sort names in alphabetical order
 - (iv) To print list of names
 - (v) To print names having maximum length, min. length
- 8. A menu driven program (using pointers)a. Linear search b. Binary search c. Fibonacci search
- 9. A menu driven program with options (using Dynamic memory allocation) a. Bubble sort b. Insertion sort c. Selection sort
- 10. A menu driven program with options (using Character array of pointers)
 - (i) To insert a student name
 - (ii) To delete a name
 - (iii) To sort names in alphabetical order
 - (iv) To print list of names
 - (v) To print names having maximum length, min. length
- 11. Write a program to perform the following operations on Rational numbers (using Structures & pointers):
 - i) Read a Rational number
 - ii) Addition of two Rational numbers
 - iii) Subtraction of two Rational numbers
 - iv) Multiplication of two Rational numbers
 - v) Division of two Rational numbers
 - vi) Display a Rational number

12. A Bookshop maintains the inventory of books that are being sold at the shop. The list includes details such as author, title, price, publisher and stock position. Whenever a customer wants a book the sales person inputs the title and the author and the system searches the list and displays whether it is available or not. If it is not an appropriate message is displayed, if it is then the system displays the book details and request for the number of copies are required , if the requested copies are available the total cost of the requested copies is displayed otherwise the message "required copies not in stock" is displayed. Write a program for the above in structures with suitable functions.

13. Create a student data file (roll no., name, date of birth, rank) and code a program with options (**use pointers & structures**)

- (i) Listing names, dob sorted on names
- (ii) Listing names, dob sorted on dob
- (iii) Listing names, dob sorted on names, dob
- 14. a) Write a C program To copy the one file contents to the another file (using commandline arguments)
 - b) Write a C Program to count the frequencies of words in a given file.

CS/IT 211 - MATHEMATICS - III (CE /CS/EC/EEE/EI/IT/ME ...211)

Lectures	:	4 periods/week	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

Unit-I

Partial Differential Equations :

Partial Differential Equations - Introduction, Formation of Partial Differential Equations, Solutions of a Partial Differential Equation, Equations solvable by direct Integration, Linear Equations of the first Order, Non-Linear Equations of the first Order, Charpit's Method, Homogeneous Linear Equations with Constant Coefficients, Rules for finding The Complementary Function, Rules for finding The Particular Integral, Non-Homogeneous Linear Equations.

Unit-II

Beta Gamma Functions, Error Function.

Integral Transforms:

Introduction, Definition, Fourier Integrals-Fourier sine and cosine integrals, Complex form of the Fourier Integral, Fourier Transforms, Properties of Fourier Transforms, Finite Fourier sine and cosine transforms, Convolution theorem(without proof), Parseval's Identity for Fourier Transforms(without proof), Fourier Transforms of the derivatives of a function.

Unit-III

Solution of Algebraic and Transcendental Equations : Introduction, Newton- Raphson Method, Solutions of Simultaneous Linear Equations: Direct Methods of Solution-factorization method (LU - decomposition method), Iterative Methods of Solution - Gauss-Seidel Iteration Method.

Finite Differences and Difference Equations: Introduction, Finite Difference operators, Symbolic relations, Differences of a polynomial, Newton's forward and backward difference interpolation Formulae, Central Difference Interpolation Formulae-Gauss's Forward and Stirling's formulae, Interpolation with Unequal- Intervals-Lagrange's Interpolation , inverse interpolation. Difference Equations: Introduction, Formation, Linear difference equations - Rules for Finding the Complementary Function, Rules for Finding the Particular Integral.

Unit-IV

Numerical Differentiation: Finding First and Second order Differentials using Newton's formulae, Numerical Integration : Trapezoidal rule, Simpson's one-third rule, Numerical Solution of Ordinary and Partial Differential Equations - Euler's Method, Picard's Method, Runge- Kutta Method of fourth order (for first order equations, Simultaneous equations) Classification of Partial Differential Equation of second order, Solutions of Laplace's and Poisson's Equations by iteration methods.

Text Book :

[1] Higher Engineering Mathematics by B.S.Grewal Khanna publishers, 39th edition.

Reference Books:

[1] A textbook of Engineering Mathematics by N.P. Bali

[2] Advanced Engineering Mathematics by Erwin Keyszig, John Wiley and sons.

CS/IT 212 - CIRCUIT THEORY

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

INTRODUCTION OF CIRCUIT ELEMENTS :

The unit of Charge, Voltage, Current, Power and Energy, Circuit Elements, Circuit concepts, Resistance, Inductance and capacitance, KVL and KCL, Series and Parallel combination of network elements types of sources, energy stored indicators and capacitors.

METHODS OF ANALYSING CIRCUITS: Mesh analysis, Source transformations.

UNIT - II

NETWORK THEOREMS:

Star - Delta transformation, Superposition, Thevenin, Norton, Reciprocity, compensation, Maximum power, Tellagan and Application of theorems to DC & AC circuits.

ASLTERNATIVE PERIODIC WAVEFORMS:

Instantaneous current, voltage and power, peak, effective and average voltage and current, crest factor and form factor, pohase difference.

SINUSODIAL STEADY STATE ANALYSIS:

'J' notation and phasor representation. Response of RLC, series, parallel and series parallel circuits to sinusoidal excitation, computation of active, reactive and complex power, power factor.

UNIT - III

TWO-PORT NETWORK:

Two-port Network, Open circuit impedance (Z), short circuit admittance (Y), Hybrid parameters.

RESONANCE:

Series and Parallel resonance, selectivity, bandwidth and Q of tuned circuits. Tme constant.

UNIT - IV

LAPLACE TRANSFORMS AND TRANSIENTS:

Laplace Transforms of typical Signals, Initial value and final values theorems; Response of simple R-L, R-C and R-L-C series and parallel circuits subjected to DC and sinusoidal excitations using differential equation approach and Laplace Transform method with initial conditions; DC transients of R-L, R-C Series and Parallel R-L-C circuits, Time Constants.

Text Books:

- 1. Engineering Circuit Analysis William H.Hayt, Jack E.Kemmerly and Steven M.Durbin, TMH, 6th Edition, 2002
- 2. Networks Analysis M.E.Vanvalkenburg, PHI,2003
- 3. Circuits & Networks: Analysis and Synthesis, A.Sudhakar & Shyammohan. TMH, 3rd Edition 2006

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(17 periods)

(18 periods)

(15 periods)

(20 periods)

DIGITAL LOGIC DESIGN

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT-I

(17 periods)

Review of Number systems & codes, Representation of integers and Floating point numbers, Accuracy. Introduction to integer arithmetic operations.

BOOLEAN ALGEBRA AND LOGIC GATES: Basic Definitions, Axiomatic definition of Boolean Algebra, Basic theorems and Properties of Boolean Algebra, Boolean functions, Canonical and Standard Forms, Other operations, Digital Logic Gates.

SIMPLIFICATION OF BOOLEAN FUNCTIONS: The Map Method, Two and three variable Maps, Four-variable Map, Five and six-variable Maps, Product of Sums Simplification, NAND and NOR implementation, other two-level implementations, Don't-Care conditions, The Tabulation Method, Determination of Prime Implicants, Selection of Prime-Implicants.

COMBINATIONAL LOGIC: Design Procedure, Adders, Subtractors, Code conversion, Analysis procedure.

COMBINATIONAL LOGIC WITH MSI AND LSI: Binary parallel adder, Decimal adder, Magnitude comparator, Decoders, Multiplexers.

UNIT -III

UNIT - II

(15 periods)

(15 periods)

SEQUENTIAL LOGIC: Flip Flops, Triggering of Flip-Flops, Synthesis and Analysis of Clocked Sequential Circuits, State tables and State diagrams. State Reduction and assignment, Flip-Flop Excitation tables, Design Procedure, Design of counters, Design with state equations.

UNIT-IV

(18 periods)

REGISTERS, COUNTERS: Registers, Shift registers, Ripple counters, Synchronous counters, Timing sequences.

MEMORIES: Classification of ROMs, EPROMs, EEPROMs, RAMs,

PROGRAMMABLE LOGIC: Read only memory (ROM), Programmable logic device (PLD), Programmable logic array (PLA), Programmable array logic (PAL).

Text Book: Donald e Givone, Digital Principles and Design, TMH.

Reference Books:

- Morris Mano: Computer Engineering Hardware Design, PHI. 1.
- R.P.Jain: Modern digital electronics, 3rd edition, TMH. 2.
- 3. A.Anand kumar: Fundamentals of digital circuits, 4th edition, PHI.

OBJECT ORIENTED PROGRAMMING

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	:	70

Unit - I

(17 periods)

An Overview of C++: The Origins of C++, What is Object Oriented Programming, some C++ fundamentals, Old-Style Vs Modern C++, Introducing C++ Classes, Function Overloading, Operator Overloading, Inheritance, Constructors and Destructors, The C++ Keywords, The General Form of a C++ Program

Classes and Objects: Classes, Structures and Classes, Unions and Classes are Related, Friend Functions, Friend Classes, Inline Functions, Parameterized Constructors, Static Class Members, When Constructors and Destructors are Executed, Scope Resolution Operator, Nested Classes, Local Classes, Passing and Returning Objects, Object Assignment

Arrays, Pointers, References and the Dynamic Allocation: Arrays of Objects, Pointers, References, Dynamic Allocation Operators, The Placement Forms of new and delete.

Unit-II

(18 periods)

Function Overloading, Copy Constructors and Default Arguments: Function Overloading, Overloading Constructor Functions, Copy Constructors, Finding the Address of an Overloaded Function, Overload Anachronism, Default Arguments, Function Overloading and Ambiguity.

Operator Overloading: Creating Member Operator Function, Overloading Using a Friend Function, Overloading new delete, Overloading Special Operators & Comma Operator

Inheritance: Base-Class Access Control, Inheritance and protected members, Inheriting Multiple Base Classes, Constructors, Destructors and Inheritance, Granting Access, Virtual Base Classes.

Unit-III

(15 periods)

Virtual Functions & Polymorphism: Virtual Functions, The Virtual Attribute is inherited, Virtual Functions are Hierarchical, Pure Virtual Functions, Using Virtual Functions, Early Vs Late Binding. **Templates:** Generic Functions, Applying Generic Functions, Generic Classes, Typename and export Keywords, Power of Templates.

Exception Handling: Fundamentals, Derived-Class Exceptions, Options, Terminate() and unexpected(), uncaught_exception(), exception and bad_exception Classes, Applying Exception Handling.

Unit - IV

(15 periods)

The C++ I/O System Basics: Old Vs. Modern C++ I/O, Streams, Stream Classes, Formatted I/O, Overloading << and >>, Creating Manipulators.

C++ File I/O: File Classes, Opening and Closing a File, Text Files, Unformatted Binary I/O, get(), Getline() functions, Detecting EOF ignore() peak() putback() flush(), Random Access, I/O Status, Customized I/O and Files.

Runtime Type ID and the Casting Operators: RTTI, Casting Operators, Dynamic_cast, Reinterpret_cast.

Namespaces, Conversion Functions and other Advanced Topics: Namespaces, The std Namespace, Creating Conversion Functions, const Member Functions and mutable, Volatile Member Functions, Explicit Constructors, asm Keyword, Linkage Specification, Array-Based I/O, Dynamic Arrays, Binary I/O with Array-Based Streams, Differences between C and C++.

Introducing Standard Template Library: An Overview of STL

Text Book:

1. The Complete Reference - C++ - Herbert Schieldt, 4/e, Tata McGraw Hill.

Reference Books:

- 1. Bjarne Stroustrup, "The C++ Programming Language", Special Edition, Pearson Education.
- 2. C++ How to Program Dietel & Dietel
- 3. Programming in C++ Barkakati
- 4. Mastering C++ by Venugopal

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Strategies, Fundamentals of Logic, Logical Inferences, Methods of Proof of an implication, First order Logic & Other methods of proof. Rules of Inference for Quantified propositions.

UNIT - II

Elementary Combinatorics, Basics of Counting, Combinations and Permutations, Enumeration of Combinations and Permutations, Enumerating Combinations and Permutations with repetitions, Enumerating Permutation with Constrained repetitions. Recurrence relations, Generating functions of sequences, Calculating Coefficients of Generating Functions.

UNIT - III

Recurrence relations, Solving recurrence relations by Substitution and generating functions. The methods of characteristic roots, solutions of inhomogeneous recurrence relations.

Relations and digraphs, Special properties of binary relations, Equivalence relations. Operations on relation.

UNIT - IV

Ordering relations, Lattices and Enumerations, Paths and Closures, Directed Graphs and Adjacency Matrices, Application : Topological Sorting.

Graphs: Basic Concepts, Isomorphisms and Subgraphs, Planar Graphs, Euler's Formula; Multigraphs and Euler Circuits, Hamiltonian Graphs, Chromatic Numbers, The Four Color Problem.

TEXT BOOK:

1. Toe L.Mott, Abraham Kandel & Theodore P.Baker, Discrete Mathematics for Computer Scientists & Mathematicians, PHI 2nd edition.

REFERENCE BOOKS:

- 1. C.L. Liu, "Elements of Discrete Mathematics'.
- 2. Rosen, 'Discrete Mathematics'.

DISCRETE MATHEMATICAL STRUCTURES

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

Foundations: Sets, Relations and Functions, Methods of Proof and Problem Solving

UNIT - I

(17 periods)

(18 periods)

(17 periods)

(18 periods)

CS/IT 215

Mathematical Induction.

DATA STRUCTURES

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	:	70

UNIT - I:

(18 periods)

Algorithm Analysis: Mathematical Back Ground, Model, What to Analyze, Running Time Calculations.

Lists: Abstract Data Types, The List ADT, Singly Linked List ADT, Doubly Linked List ADT, Circular Linked List ADT, Polynomial ADT.

UNIT - II:

(17 periods)

Stacks and Queues: The Stack ADT and its applications such as Infix to Postfix expression conversions, Evaluation of Postfix expressions, Delimiter Matching. The Queue ADT, The Circular Queue ADT.

Sorting Preliminaries - Shellsort - Mergesort - Quicksort

(15 periods)

Preliminaries - Binary Trees - Implementation, Expression trees. The Search Tree ADT - Binary Search Trees, Implementation. AVL Trees - Single Rotations, Double rotations.

UNIT - IV:

UNIT - III:

(15 periods)

Hashing - General Idea - Hash Function - Separate Chaining - Open Addressing - Linear Probing - Priority Queues (Heaps) - Model - Simple implementations - Binary Heap - Heap Sort.

Graphs: Definitions, representations, graph traversals.

TEXT BOOK:

1. Mark Allen Weiss, "Data Structures and Algorithm Analysis in C", Second Edition, Pearson Education.

REFERENCE BOOKS:

- 1. Y.Langsam, M.J.Augeustein and A.M.Tenenbaum, "Data Structures Using C", Pearson Education Asia, 2004.
- 2. Richard F.Gilberg, Behrouz A. Forouzan, "Data Structures A Pseudocode Approach with C", Thomson Brooks / COLE, 1998.
- 3. Aho, J.E. Hopcroft and J.D. Ullman, "Data Structures and Algorithms", Pearson Education Asia, 1983.

OOPS LAB

Lectures	 3 periods/week	Sessional Marks	:	25
University Exam	 3 hours	University Examination Marks	:	50

- 1. Create a class HUGEINT by which we would be able to use much wider range of integers. Perform addition operation on two HUGEINTs.
- Create a class TIME with appropriate data members to represent TIME. Construct a class implementation section to compare two TIMEs, to increment TIME by one second, to decrement TIME by one second and appropriate constructors to create TIME objects.
- 3. Write a class declaration for DATE and allow the operations to find nextday(), previousday(), leapyear(), comp()- which returns later DATE with appropriate constructors and destructors.
- 4. Create a user defined datatype STRING, allow possible operations by overloading (Relational operators,[], (), <<,>>, =).
- 5. Define RATIONAL class. Allow possible operations on RATIONALs by overloading operators(Arithmetic, Unary operators, <<,>>).
- 6. a. A program to implement Single inheritance
 b. A program to implement Multiple inheritance
 c. A program to implement Hierarchical inheritance
 d. A program to implement Multipath inheritance
- 7. a. A program to implement runtime polymorphismb. A program to implement abstract base class concept.
- 8. Develop a program to sort elements using function template
- 9. A program on class template
- 10. A program to implement Exception Handling
- 11. Write a program to read STUDENT records and write into file "STUDENT" by defining STUDENT class. Display STUDENTs data in a tabular format by defining appropriate manipulators.
- 12.a. A program on FILEs.
 - b. A program on command line arguments.

DATA STRUCTURES LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

- 1. Code the following list ADT operations using array, single linked list, double linked list.
 - (a) void is_emptyList(List 1)
 - (c) Position firstPost(List 1)
 - (e) Position nextPost(List 1, Position p)
 - (g) Position find)List 1. Element x)
- (b) List makeNullList(size n)
- (d) Position endPost(List 1)
- (f) Position prevPos(List 1, position p)
- (h) Position findKth(List 1, int k)
- (i) void insert(List 1, Position p) (j) void delete(List 1, Position p)
- (k) void append(List 1, Element x)
- (l) int cmp(List 1, Position p1, Position p2)
- (m) int cmp2(List11, List12, Position p1, Position p2)
- (n) void swap(List 1, Position p1, Position p2)
- (o) Element retrieveElement(List 1, Position p)
- (p) void print element(List 1, Position p)
- 2. Using the above List ADT operations, Write a menu driven program to support following higher level list operations:
 - Create null list (a)
 - (b) Read a list of elements into the list.
 - Insert an element in the K^{th} position of the list Delete an element in the K^{th} position of the list (C)
 - (d)
 - (e) Delete a given element from the list
 - Find whether given element is present in the list (f)
 - Display the elements of the list (g)
- 3. Write a program that reads two lists of elements, prints them, reverses them, prints the reverse list, sort the lists, print the sorted lists, merges the list, prints merge list.
- 4. Implement a polynomial ADT and write a program to read two polynomials and print them, adds the polynomials, prints the sum, multiply the polynomials and print the product.
- 5. Implement stack ADT and write a program that reads an infix arithmetic expression of variables, constants, operators (+, -, *, /) and converts it into the corresponding postfix form. Extend the program to handle parenthesized expression also.
- Implement Queue ADT and write a program that performs Radix sort on a given set 6. of elements.
- 7. Implement the following sorting operations:-
- (a) Shell Sort, (b) Heap Sort (C) Merge Sort (d) Quick Sort 8. Implement Binary Tree ADT and write a program that reads postfix Arithmetic expression form, builds the expression tree and performs tree Traversal on it.
- 9. Implement Binary search ADT and write a program that interactively allows (a) Insertion (b) Deletion (c) Find min (d) Find max (e) Find operations
- 10. Implement AVL Tree ADT and Write a program that interactively allows (a) Insertion (b) Deletion (c) Find_min (d) Find_max
- 11. Implement Hashing and Write a program to find a element using Open Addressing.

COMMUNICATION SKILLS LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	:	3 hours	University Examination Marks		50

The course is divided into four modules. The first module focuses on language skills, the second on writing skills, the third on personality and interaction skills and the fourth on Vocabulary.

MODULE-1: <u>Computer aided instruction</u>:

- 1. <u>Phonetics</u>: Study of speech sounds
 - (a) Vowels
 - (b) Consonants
 - (c) Accent Training
 - (d) Pronunciation
 - (e) Intonation
- 2. <u>Reading Comprehension</u>:
 - (a) Reading for main idea
 - (b) Scanning and Skimming the text
 - (c) Inference of Lexical and Contextual meaning

MODULE-2: <u>Presentation/Reporting Skills</u>:

- <u>Paper Presentation</u>:

 (a) Identification of source material
 (b) Arrangement of collected data
- <u>Resume Preparation</u>:

 (a) Identification of information
 (b) Format arrangement
- 3. Technical Reporting:
 - (a) Types of formats & styles
 - (b) Data collection
 - (c) Organization and clarity

MODULE-3: <u>Personality and Interaction Skills</u>:

- 1. <u>Fundamentals of Interpersonal skills</u>:
 - (a) Body language
 - (b) Listening skills
 - (c) Role play
- 2. <u>Situational Rounds</u>:
 - (a) Critical thinking
 - (b) Analytical thinking
 - (c) Creative thinking
 - (d) Observation Activity
 - Interview Skills:
 - (a) Dress code

3.

- (b) Behavioral attitude
- (c) Frequently asked questions
- 4. <u>Group Discussion</u>:
 - (a) Modulation of Voice, body language and fluency
 - (b) Summarizing
 - (c) Team spirit

- 5. <u>Telephonic Interaction</u>:
 - (a) Formal/Informal Interaction
 - (b) Receiving Messages/Complaints
 - (c) Tone Modulation

MODULE-4: Vocabulary:

- (a) Synonyms
- (b) Antonyms
- (c) Analogies
- (d) Idioms
- (e) One word substitute

SUGGESTED SOFTWARE:

- Cambridge Advanced Learners' Dictionary with exercises
- The Rosetta Stone English Library
- Clarity Pronunciation Power
- Mastering English in Vocabulary, Grammar, Spellings, Composition
- Dorling Kindersley series of Grammar, Punctuation, Composition etc.
- Language in Use, Foundation Books Pvt Ltd
- Learning to Speak English 4 CDs
- Microsoft Encarta
- Murphy's English Grammar, Cambridge

SUGGESTED READING:

- 1. Developing Language Skills: 1. (Foundation Books)
- 2. Objective English for Competitive Examinations (Third edition) Hari Mohan Prasad, Uma Rani Sinha (Tata McGraw Hill)
- 3. Better English Pronunciation JD O'Connor (CUP)
- 4. English Pronouncing Dictionary Daniel Jones.
- 5. Effective Technical Communication M.Ashraf Rizvi (Tata McGraw Hill)
- 6. English for Engineers
 - i. Prepared by Regional Institute of English,
 - ii. South India, Bangalore (Foundation Books)
- 7. Cambridge Preparation Guide for TOEFL.
- 8. Dictionary of Technical Terms F.S.Cripsin (Oxford IBH)
- 9. Cambridge Advanced Learner's Dictionary
- 10. Cambridge Idioms Dictionary
 - a. Basic Correspondence & Report writing -Sharma (Tata McGraw Hill)
- 11. Business Correspondence and Report Writing R.C.Sharma, Krishna Mohan, (Tata McGraw Hill)
- 12. Dictionary of Misspelled and Easily Confused Words David Downing, Deborah K.Williams (Tata McGraw Hill)
- 13. Wings of Fire Dr.A.P.J.Abdul Kalam.
- 14. My Experiments with Truth M.K.Gandhi.

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⁴³ A.N.U B.Tech (IT) w.e.f. 2007-08

CS/IT/ME 221

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

PROBABILITY & STATTISTICS

Unit-l

(18 periods)

Probability Densities: Continuous Random Variables, Normal Distribution, Normal Approximation to the Binomial Distribution, other Probability Densities, Uniform Distribution, Log-Normal Distribution, Gamma Distribution, Beta Distribution, Weibull Distribution, Joint Distributions - Discrete and Continuous, Checking if the Data Are Normal, Transforming Observations to Near Normality, Simulation.

Sampling Distribution: Populations and Samples, Sampling Distribution of the Mean (SD known), Sampling Distribution of the Mean (SD Unknown), Sampling Distribution of the Variance.

Unit-II

Inferences Concerning Means: Point Estimation, Interval Estimation, Tests of Hypotheses, Null Hypotheses and Tests of hypotheses, Hypotheses Concerning One Mean, Relation between Tests and Confidence Intervals, Operating Characteristic Curves, Inferences Concerning Two Means, Design Issues - Randomization and Pairing.

Inferences Concerning Variances: Estimation of Variances, Hypotheses Concerning One Variance, Hypotheses Concerning Two Variances.

Inferences Concerning Proportions: Estimation of Proportions, Hypotheses Concerning One Proportion, Hypotheses Concerning Several Proportions, Analysis of $r \times c$ Tables, Goodness of Fit.

Unit-III

Curve Fitting: Method of Least Squares, Inferences based on the Least Squares Estimators, Curvilinear Regression, Multiple Regression, Checking the Adequacy of the Model, Correlation, Multiple Linear Regression.

Analysis of Variance: General Principles, Completely Randomized Designs, Randomized-Block Designs, Multiple Comparisons, Further Experimental Designs, Analysis of Covariance.

Unit -IV

(15 periods)

Statistical Content of Quality-Improvement Programs: Quality-Improvement Programs, Starting a Quality Improvement Program, Experimental Designs of Quality-Improvement, Quality Control, Control Charts for Measurements, Control Charts for Attributes, Tolerance Limits, Acceptance Sampling.

Applications to Reliability and Life Testing: Reliability, Failure-Time Distributions, Exponential Model in Reliability, Exponential Model in Life Testing, Weibull Model in Life Testing.

Text Book:

Miller & Freund's: "Probability and Statistics for Engineers", 6/e, PHI by Richard A.Johnson.

Reference Book:

1. S.C.Gupta & V.K.Kapoor, "Fundamentals of Mathematical Statistics", S.Chand & Co,.

(15 periods)

(17 periods)

ENVIRONMENTAL STUDIES

(Common for all branches)

Lectures	:	4 periods/week	Sessional Marks		30
University Exam	•••	3 hours	University Examination Marks	•••	70

UNIT - I

Introduction: Definition, Scope and Importance

Ecosystems: Introduction, types, characteristic features, structure and functions of Ecosystems- Forest, Greenland, Desert, Aquatic (lakes, rivers, and estuaries) **Natural Resources:**

Land resources - Land as a resource, Common property resources, land degradation, soil erosion and desertification and Effects of modern agriculture, fertilizer- pesticide problems

Forest Resources- Use and over-exploitation, Mining and dams; their effects on forests and tribal people.

Water Resources - Use and over-utilization of surface and ground water, floods and drought, Water logging and salinity, Dams - benefits and costs, Conflicts over water.

Energy resources: Energy needs, Renewable and non-renewable energy sources, Use of alternate energy sources.

UNIT - II

Biodiversity and its Conservation: Value of biodiversity- consumptive and productive use, social, ethical, aesthetic and option values. Bio-geographical classification of India-India as a mega-diversity habitat. Threats to bio-diversity - Hot spots, habitat loss, poaching of wildlife, loss of species, seeds, etc. Conservation of biodiversity - In-situ and Ex-situ conservation.

Environmental Pollution: Causes, effects and control measures of Air pollution, Water pollution, Soil pollution, Marine pollution, Noise pollution, Solid waste management, composting and vermiculture, Urban and industrial wastes, recycling and re-use.

UNIT -III

Sustainability: Theory and practice, equitable use of resources for sustainable life styles.

Rain water harvesting, cloud seeding and watershed management, Water scarcity and ground water depletion.

Controversies on major dams - Resettlement and rehabilitation of people, problems and concerns.

Nature of thermal pollution and nuclear hazards, Global warming, Acid rain, Ozone depletion. Green revolution.

Population growth and environment.

Environmental Impact Assessment.
UNIT - IV

Environmental acts: Water (Prevention and Control of pollution) act, Air (Prevention and Control of pollution) act, Environmental protection act, Wild life protection act, Forest Conservation act.

International Conventions: Stockholm Conference 1972, Earth Summit 1992

Case Studies: Chipko movement, Narmada Bachao Andolan, Silent Valley Project, Madhura Refinery and Taj Mahal, Chernobyl Nuclear Disaster, Tehri Dam, Ralegaon Siddhi (Anne Hazare), Florosis and Bhopal Tragedy.

Field work

Visit to a local area to document environmental assets - river/ forest/ grassland / hill /mountain.

Study of local environment-common plants, insects, birds.

Study of simple ecosystems - pond, river, hill, slopes etc.,

Visits to industries, water treatment plants, effluent treatment plants

Text Book

1) Benny Joseph, Environmental Studies, the Tata McGraw-Hill Publishing Company Limited, New Delhi.

Reference Books:

- 1) Text Book of environmental studies, Erach Bharucha, UGC.
- 2) Environmental studies by Anubha Kaushik and C.P.Kaushik.
- 3) A basic course of environmental studies by S.Deswal and A.Deswal, Dhanapath Rai & Co,.
- 4) Essentials of environmental studies, Kurian Joseph and R.Nagendram, Pearson Education Pte.Ltd., Delhi.
- 5) Environmental studies, R.Rajagopalan, Oxford university press.
- 6) Environmental Pollution Control Engineering, C. S. Rao, Wiley Eastern Ltd., New Age International Ltd.,
- 7) Introduction to Environmental Science, Anjaneyulu Y, B S Publications
- 8) Principles of Environmental Studies, Manoharachary C and Jayarama Reddy P, B.S. Publications

⁴⁶ A.N.U B.Tech (IT) w.e.f. 2007-08

ELECTRONIC DEVICES & CIRCUITS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks		70

UNIT-I

CS/IT 223

(17 periods)

SEMICONDUCTOR DIODES: Semiconductor diode, Zener diode, Load line analysis, Half-Wave Rectifier, Full-Wave rectification, Clippers and Clampers.

BIPOLAR JUNCTION TRANSISTOR: Transistor operation, Common base configuration, Transistor amplifying action, Common emitter configuration, Common collector configuration, Operating point, Fixed bias circuit, Emitter stabilized bias circuit, Voltage divider bias, Transistor h-parameter model, Analysis of transistor amplifier using hparameters.

UNIT - II

(18 periods)

UNIPOLAR DEVICES: Characteristics of JFETs, Transfer characteristics, Depletion type MOSFET, Enhancement type MOSFET, fixed bias configuration, Self-bias configuration, FET small signal model, Source follower circuit, Common gate circuit, Unijunction Transistor. UNIT -III (17 periods)

FEEDBACK AND OSCILLATOR CIRCUITS: Feedback concepts, feed back connection types, Barkhausen criteria, Phase-Shift oscillator, Wien bridge oscillator, Hartley oscillator, Colpitts oscillator.

UNIT -IV

(18 periods)

OPERATIONAL AMPLIFIERS: Differential and common mode operation, OP-Amp basics, Op-Amp specifications, Voltage summing, Voltage buffer, Differentiator and Integrator. **LINEAR ICS:** Timer IC unit operation, Voltage controlled oscillator.

Text Books:

- 1. Robert Boylestad & Louis Nashelsky, 'Electronic Devices and Circuit Theory', 6th Edition, PHI.
- 2. N.N.Bhargava & Kulasresta, 'Basic Electronics', Tata McGrawHill Publishers.

Reference Books:

- 1. Milliman & Halkias, 'Integrated Electronics', Tata McGrawHill Publishers.
- 2. S.Salivahanan & Vallavaraj, 'Electronic Devices and Circuits', Tata McGrawHill Publishers.

COMPUTER ORGANIZATION

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I:

BASIC STRUCTURE OF COMPUTERS: Computer Types, Functional unit, Basic OPERATIONAL concepts, Bus structures, Software, Performance, multiprocessors and multi computers. **MACHINE INSTRUCTIONS AND PROGRAMS:** Numbers, Arithmetic Operations and Characters, Memory locations and addresses, Memory Operations, Instructions and Instruction Sequencing, Addressing Modes, Basic Input/Output Operations, Stacks and Queues, Subroutines, Additional Instructions, Encoding of Machine Instructions

UNIT II:

BASIC PROCESSING UNIT:

Some fundamental concepts, Execution of a complete instruction, Multiple -Bus Organization, Hardwired control, Micro programmed control

ARITHMETIC:

Addition and Subtraction of Signed Numbers, Design of fast adders, Multiplication of Positive numbers, Signed operand multiplication, Fast multiplication, Integer Division, Floating point numbers and operations.

UNIT III:

THE MEMORY SYSTEM: Some Basic Concepts, Semiconductor RAM Memories, Read-Only memories, Speed, Size and Cost, Cache Memories, performance Considerations, Virtual

memories, Memory management Requirements, Secondary Storage **PIPELINING:** Basic Concepts, Data Hazards, Instruction hazards, Influence on Instruction Sets, Data path and Control Considerations, Superscalar Operation, performance Considerations.

UNIT IV:

(15 periods)

INPUT/OUTPUT ORGANIZATION: Accessing I/O Devices, Interrupts, Direct Memory Access, Buses, Interface Circuits, Standard I/O Interfaces: PCI Bus, SCSI Bus, USB Bus

TEXT BOOKS:

Computer Organization - Carl Hamacher, Zvonko Vranesic, Safwat Zaky, Fifth Edition, McGraw Hill.

REFERENCE BOOKS :

1. Computer Architecture and Organization-John P. Hayes, Third Edition, McGraw Hill

- 2. Computer Organization and Architecture William Stallings, Sixth Edition, Pearson/PHI
- 3. Computer Systems Architecture M. Morris Mano, Third Edition, Pearson/PHI.

CS/IT 224

(20 periods)

(15 periods)

(20 periods)

CS/IT 225 MICROPROCESSORS AND MICROCONTROLLERS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT-I:

(20 periods)

The 8086 Microprocessor Family, the 8086 Internal Architecture: Introduction to Programming the 8086.

8086 Family Assembly Language Programming, Implementing standard Program Structures in 8086 Assembly language, Strings ,Procedures and Macros,8086 Instruction descriptions and Assembler directives.

UNIT-II:

(15 periods)

8086 System Connections, Timing: The Basic8086 Microcomputer System, 8086 Bus activities during the Read and Write Machine Cycles, 8086 pin Diagram; 8086 Interrupts and Interrupt Applications: 8086 Interrupts and Interrupts Responses.

Unit-III:

(20 periods)

Interfacing Peripherals and Applications: Interfacing the Microprocessor to the Keyboard, Alphanumeric displays; 8259 Priority Interrupt Controller, 8237 DMA Controller.

The 8051 Microcontrollers - Assembly language Programming- JUMP, LOOP, CALL instructions.

UNIT-IV: MICROCONTROLLERS:

(15 periods)

I/O port Programming- addressing Modes, Arithmetic, Logic, Single -bit instructions and Programming-Timer Counter programming in the 8051, 8051 Serial communication-Interrupts Programming.

TEXT BOOK:

- 1. Douglas V. Hall, "Microprocessors and Interfacing" Tata McGraw-Hill, Revised Second Edition.
- 2. "Muhammad Ali Mahadi and Janice Gillespie Mazidi ,'The 8051 Microcontroller and Embedded Systems" Pearson Education 2004

REFERENCE BOOKS:

- 1. Yu-cheng Liu, Glenn A. Gibson, "Microcomputer systems: The 8086 /8088 Family architecture, Programming and Design", Second edition, Prentice Hall of India, 2003.
- 2. Barry B. Brey, "The Intel Microprocessors, 8086/8088, 80186/80188, 80286, 80386, 80486, Pentium, PentiumPro Processor, PentiumII, PentiumII, PentiumIV, Architecture, Programming & Interfacing", Sixth Edition, Pearson Education / Prentice Hall of India, 2002.
- 3. 8051 Micro Controller Architecture, Programming and Applications by Kenneth J.Ayala.

OPERATING SYSTEMS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I:

(20 periods)

Computer System Overview: Basic Elements, Processor Registers, Instruction Execution, Interrupts, The Memory Hierarchy, Cache Memory, I/O Communication Techniques.

Operating System Overview: Objectives and Functions, Evolution, Major Achievements, Developments Leading to Modern OS, MS Windows Overview, Traditional UNIX Systems, Modern UNIX Systems, Linux.

Process Description & Control: Process, States, Description, Control, UNIX SVR Process Management.

UNIT II:

(20 periods)

Threads, SMP and Microkernels: Processes and Threads, Symmetric Multiprocessing, Microkernels, Thread and SMP Management, Solaris Thread and SMP Management, Linux Process and Thread and SMP Management

Concurrency: Mutual exclusion and Synchronization: Principles of Concurrency, Mutual Exclusion, Semaphores, Monitors, Message Passing, Readers/Writers Problem.

Concurrency: Deadlock and Starvation: Principles of Deadlock, Prevention, Avoidance and Detention of Deadlocks, An integrated Deadlock strategy, Dining Philosophers Problem, UNIX Concurrency Mechanism, Linux Kernal Concurrency Mechanism, Solaris Thread Synchronization Primitives, Windows Concurrency Mechanisms.

UNIT III:

(15 periods)

Memory Management: Requirements, Partitioning, Paging, Segmentation.

Virtual Memory: Hardware and Control Structures, OS Software, UNIX, Solaris, Linux & Windows Memory Management.

Uniprocessor Scheduling: Types of Processor Scheduling, Scheduling Algorithms, Traditional UNIX Scheduling.

UNIT IV:

(15 periods)

Multiprocessor and Real-Time Scheduling: Multiprocessor Scheduling, Real-Time Scheduling, Linux Scheduling, UNIX SVR 4 Scheduling, Windows Scheduling.

I/O Management and Disk Scheduling: I/O Devices, Organization of the I/O Function, OS Design Issues, I/O Buffering, Disk Scheduling, RAID, Disk Cache, UNIX SVR 4 I/O, Linux I/O, Windows I/O.

File Management: Overview, Organization and Access, Directories, Sharing, Record Blocking, Secondary Storage Management, UNIX File Management, Linux Virtual File System, Windows File System.

TEXT BOOKS:

1. William Stallings, "Operating Systems - Internals and Design Principles", 5/e, Pearson.

REFERENCE BOOKS :

- 1. Silberschatz & Galvin, 'Operating System Concepts', 5th edition, John Wiley & Sons (Asia) Pvt.Ltd.,2001.
- 2. Charles Crowley, 'Operating Systems : A Design-Oriented Approach', Tata McGraw Hill Co., 1998 edition.
- 3. Andrew S.Tanenbaum, 'Modern Operating Systems', 2nd edition, 1995, PHI.

EDC LAB

Lectures		3 periods/week	Sessional Marks		25
University Exam	•••	3 hours	University Examination Marks	•••	50

LIST OF EXPERIMENTS

- 1. Characteristics of Silicon, Germanium diodes.
- 2. Characteristics of Zener diode.
- 3. Half Wave Rectifier.
- 4. Transistor Characteristics in CE configuration.
- 5. Self Bias circuit
- 6. Characteristics of F.E.T
- 7. Characteristics of U.J.T
- 8. Logic Gates using Discrete Components
- 9. Logic Gates using Universal Gates
- 10. Combinational Circuits
- 11. Code converter
- 12. Flip Flops
- 13. Counters
- 14. Ring Counter and Johnson Counter

CS/IT 262 MICROPROCESSORS AND MICROCONTROLLER LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam		3 hours	University Examination Marks	•••	50

- 1. Write a 8086 assembly language program to arrange the given numbers in ascending order.
- 2. Write a 8086 assembly language program to count number of +ve elements, -ve elements, zeros in the given array.
- 3. Write a 8086 assembly language program to find the square of a number using lookup-table.
- 4. Write a 8086 assembly language program to move a sting byte from a memory location to another memory location.
- 5. Write a 8086 assembly language program to calculate the maximum and minimum in an array.
- 6. Write a8086 assembly language program to convert BCD to binary using near procedures.
- 7. Write a8086 assembly language program to calculate nCr by using near procedures.
- 8. Write a program to display a string of characters (use Keyboard/Display Interfacing)
- 9. Write a program to generate an interrupt using 8259 Interrupt Controller. Assume two sources are connected to the IR lines of the 8269. Of these key board has highest priority and printer has the lowest priority.
- 10. Assume that 5 BCD data items are stored in RAM locations starting at 40H. Write a program to find the sum of all the numbers. The result must be in BCD.
- 11. Write a program with three sub-routine to transfer the data from on-chip ROM to RAM location starting at 30H b)add them and save in 70Hc)find the average of the data and store it in R7.notice that data is stored in a code space of on-chip ROM.
- 12. Program the 8051 timers to generate time delay.

SOFT SKILLS LAB

Lectures		3 periods/week	Sessional Marks		25
University Exam	•••	3 hours	University Examination Marks	•••	50

Soft Skills are emotion based competencies that define an individual. The objective is to develop the intellectual, emotional and social understanding of every student and to make students become productively engaged citizens with knowledge, skills, dispositions and confidence to participate fully in life. It guides the students toward competency in Thinking and Reasoning Skills, Social and Civic Responsibility, character, communication and Employability.

The Methodology includes Interactive Sessions, Role Play, Sell-out, Team Work / Group Work / Pair work, Group Discussion, Peer Evaluation and Written examination. The emphasis is on learning by doing.

MODULE-1: Non-Verbal Communication:

- 1. Voluntary body language.
- 2. Involuntary body language.
- 3. Facial expressions.
- 4. Proxemics.
- 5. Kinesics.
- 6. Oculesics.
- 7. Haptics.
- 8. Chronemics.
- 9. Para linguistics.

MODULE-2: Written Communication:

- 1. Situational Analysis.
- 2. Critical Thinking.
- 3. Lateral Thinking.
- 4. Creative Thinking.

MODULE-3: Emotional Intelligence and Self Esteem:

Emotional Intelligence:

- 1. Self awareness
- 2. Self control
- 3. Self motivation
- 4. Empathy
- 5. Relationship Skills.
- 6. Exercises on Johari Window.

Self Esteem:

- 1. Competence
- 2. Confidence
- 3. Mastery
- 4. Achievement
- 5. Independence
- 6. Self-regard

MODULE-4: <u>Employability</u>:

- 1. Selection Procedure: Methods of selection followed by different companies.
- 2. Interview techniques: Mock Interviews, Stress Interviews
- 3. Group Discussion:
 - (a) Participates as an effective member of a team.
 - (b) Exhibits leadership abilities and Team building.
 - (c) Possesses flexibility and adaptability.
 - (d) Group dynamics.
 - (e) Intra group dynamics.
 - (f) Inter group dynamics.
 - (g) Evolution of a group into a team.
- 4. Psychological test: Aptitude, Logic and Reasoning.

MODULE-5: Life Skills:

Behavior and Attitude:

- 1. Social behavior
- 2. Social norms.
- 3. Ethics.
- 4. Values.
- 5. Positive work ethics.
- 6. Desire to learn.
- 7. Responsibility.
- 8. Integrity / honesty.
- 9. Good attitude.
- 10. Motivation.

MODULE-6: <u>People Skills</u>:

Interpersonal Relationships

- 1. Effective listening.
- 2. Managing stress.
- 3. Probing skills.
- 4. Work place creativity.
- 5. Persuading techniques.
- 6. Questioning techniques close end, open end Questions & Answers.
- 7. Role perception.

REFERENCES:

BOOKS:

- 1. Body Language Gordon R.Wainwright, Rupa & Co.,
- 2. Personality development Rajeev K Mishra (Rupa & Co.,)
- 3. Making Presentations Hindie T (DK Publishing, London)
- 4. Technical Writing and Professional Communication -Huckin T, Oslen L (McGraw Hill)
- 5. Lateral Thinking by Debono
- 6. How to prepare for Group Discussions and Interview, Hari Mohan Prasad & Rajnish Mohan, 2nd Edition, TMH
- 7. Barrons How to prepare for the GRE, 13th Edition.
- 8. Emotional Intelligence by Daniel Goleman

- 9. Working with Emotional Intelligence by Daniel Goleman, Santam Books Publishers.
- 10. The 7 Habits of Highly Effective people by Stephen R.Covey.
- 11. Awaken the Giant within: How to take immediate control of your mental, emotional, physical and financial destiny by Anthony Robbins.

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- 12. Get better or get beaten, Jack Welch, TMH.
- 13. Principle Centered Leadership by Stephen R.Covey.
- 14. You can Vin, Shiv khera MacMillan India Limited.
- 15. I am OK, You are OK (
- 16. Born to Win by _
- 17. Unlimited Power by Anthony Robbins.
- 18. Count the Chickens before Hatched, Arindam Chowdary,
- 19. Dale Karnegie, Pocket Book Series (5 Nos.)
- 20. Kogan Page, Creating Success Series (27 Nos.)
- 21. The complete Idiots guide to, Alpha Books Series, PHI Publication (20 Nos.)

WEB SITES:

http://users3.evl.net/~pamthompson/bodylanguage.htm. http://www.owlnet.rice.edu/~cainproj http://zzyx.ucsc.edu/~archer/intro.html http://www.colostate.edu/depts/speech http://www1.chapman.edu/comm/faculty/thobbs/com401/nonverb.html

COMPUTER AIDED MATERIAL:

Train 2 success - CD Series (Zenith Global Consultancy)

CS/IT/ECE 311 PROFESSIONAL ETHICS AND HUMAN VALUES

Lectures	:	4 periods/week	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

(18 periods)

Human Values: Morals, Values and Ethics - Integrity - Work Ethic - Service Learning - Civic Virtue - Respect for Others - Living Peacefully - caring - Sharing - Honesty - Courage - Valuing Time - Co-operation - Commitment - Empathy - Self-Confidence - Character - Spirituality.

UNIT - II

(12 periods)

Engineering Ethics: Senses of 'Engineering Ethics' - Variety of moral issues - Types of inquiry - Moral dilemmas - Moral Autonomy - Kohlberg's theory - Gilligan's theory - Consensus and Controversy - Professions and Professionalism - Professional Ideals and Virtues - Theories about right action - Self-interest - Customs and Religion - Uses of Ethical Theories.

UNIT - III

(18 periods)

Engineering as Social Experimentation: Engineering as Experimentation - Engineers as responsible Experimenters - Codes of Ethics - A Balanced Outlook on Law.

Safety, Responsibility and Rights: Safety and Risk - Assessment of Safety and Risk - Risk Benefit Analysis and reducing risk.

Collegiality and Loyalty - Respect for Authority - Collective Bargaining - Confidentiality -Conflicts of Interest - Occupational Crime - Professional Rights - Employee Rights -Intellectual Property Rights (IPR) - Discrimination

UNIT - IV

(12 periods)

Global Issues: Multinational Corporations - Environmental Ethics - Computer Ethics - Weapons Development - Engineers as Managers - Consulting Engineers - Engineers as Expert Witnesses and Advisors - Moral Leadership - Sample Code of Ethics like ASME, ASCE, IEEE, Institution of Engineers (India), Indian Institute of Materials Management, Institution of electronics and telecommunication engineers (ISTE), India, etc.

Text Books:

- 1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill. New York 1996.
- 2. Govindarajan. M, Natarajan. S, Senthilkumar. V.S, "Engineering Ethics", Prentice Hall of India, 2004.

References:

- 1. Charles D Fleddermann, "Engineering Ethics", Prentice Hall, New Jersey, 2004 (Indian Reprint).
- 2. Charles E Harris, Michael S Pritchard and Michael J Rabins, "Engineering Ethics Concepts and Cases", Thompson Learning, United States, 2000 (Indian Reprint now available).
- 3. John R Boatright, "Ethics and the Conduct of Business", Pearson Education, New Delhi, 2003.
- 4. Edmund G Seebauer and Robert L Barry, "Fundamentals of Ethics for Scientists and Engineers", Oxford University Press, Oxford, 2001.

Data Communications & Networking Overview: A Communications Model, Data Communications, Data Communication Networking.

Protocol Architecture: The Need for a Protocol Architecture, A Simple Protocol Architecture, OSI, The TCP/IP Protocol Architecture,

Data Transmission: Concepts & Terminology, Analog & Digital Data Transmission, Transmission Impairments, Channel Capacity,

Guided and Wireless Transmission: Guided Transmission Media, Wireless Transmission, Wireless Propagation, Line-Of-Sight Transmission.

UNIT-II

CS/IT 312

UNIT-I

Signal Encoding Techniques: Digital Data, Digital Signals; Digital Data, Analog Signals; Analog Data & Digital Signals: Analog Data & Analog Signals.

Digital Data Communication Techniques: Asynchronous & Synchronous Transmission, Types of Errors, Error Detection, Error Correction, Line Configuration, Interfacing,

UNIT-III

Data Link Control: Flow Control, Error Control, High-Level Data link Control (HDLC). Multiplexing: Frequency Division Multiplexing, Synchronous Time Division Multiplexing, Statistical Time Division Multiplexing, Asymmetric Digital Subscriber Line, XDSL.

UNIT-IV

Circuit Switching & Packet Switching: Circuit-Switching Networks, Circuit-Switching Concepts, Control Signaling, Packet-Switching Principles, X.25.

Local Area Network Overview: Topologies & Transmission Media, LAN Protocol Architecture, Bridges, Layer2 & Layer3 Switches.

High-speed LANs: The Emergence Of High -Speed LANs, Ethernet, Token Ring, Fibre Channel.

TEXT BOOK:

1. William Stallings "Data and Computer Communications", 7/e Pearson Education / PHI.

REFERENCE BOOKS:

- 1. Wayne Tomasi "Introduction to Data Communications and Networking", PHI.
- 2. Behrouz A.Forouzan, "Data Communications and Networking", Fourth edition, TMH.
- 3. GodBole "Data Communications & Networking" TMH

DATA COMMUNICATIONS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

(16 periods)

(13 periods)

(15 periods)

(16 periods)

CS/IT 313 AUTOMATA THEORY & FORMAL LANGUAGES

Lectures	:	4 periods/week	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT - I

(18 periods)

Automata: Introduction to Automata, The central concepts of automata theory - Alphabets, Strings, Languages.

Finite Automata: An Informal picture of finite automata, Deterministic finite automata (DFA) - Definition of DFA, DFA processing strings, Notations for DFA, Extended transition function, the language of DFA, Non deterministic finite automata (NFA) - Definition of NFA, Extended transition function, the language of NFA, Equivalence of DFA and NFA Finite

Automata with \in transitions: Use of \in - transition, notation for an \in - NFA, Epsilon closures, extended transitions and languages, Applications.

UNIT - II

(15 periods)

(18 periods)

Regular Expressions and Languages: Regular expressions, finite automata and regular expressions, Algebraic laws of regular expressions.

Properties of Regular Languages: Proving languages are not regular - Pumping lemma for regular languages, Applications of the pumping lemma, Closure Properties of Regular Languages, Equivalence and minimization of automata - Minimization of DFA

UNIT - III

(Construction based treatment & proofs are excluded)

Context Free Grammars: Context Free Grammars, Parse Trees, Constructing parse trees, derivations and parse trees, ambiguous grammars.

Pushdown Automata: Definition of the Pushdown automata, the languages of PDA, Equivalences of PDA's and CFG's.

Context free languages: Normal form's for context- Free grammars, the pumping lemma for context free languages.

UNIT - IV

(15 periods)

Properties of Context free languages: closure properties for context free languages, Decision properties for CFL's.

Introduction to Turing Machines: The Turing Machine, programming techniques for Turing machines.

Undecidability: a language that is not recursively enumerable, an undecidable problem that is RE, Undecidability problems about TM, Post's Correspondence problem.

Textbook:

1. John.E.Hopcroft, R.Motwani, & Jeffery.D Ullman, "Introduction to Automata Theory,Languages and Computations", Second Edition, Pearson Education, 2003

Reference Books:

- 1. Cohen, 'Computer Theory',
- 2. KLP Mishra & N.Chandrasekharan, 'Theory of Computation', PHI.
- 3. H.R.Lewis, C.H.Papadimitriou, "Elements of The theory of Computation", Second Edition, Pearson Education, 2003.
- 4. J.Martin, "Introduction to Languages and the Theory of Computation", Third Edition, Tata McGraw Hill, 2003.
- 5. Micheal Sipser, "Introduction of the Theory and Computation", Thomson Brokecole, 1997.
- 6. Ragade, "Automata and Theoretical Computer Science", First Edition, Pearson Education, 2004.
- 7. John E Hopcroft & Jeffery D Ullman' 'Introduction to Automata Theory & Languages and Computation', Narosa Publishing House.

JAVA PROGRAMMING

Lectures	•••	4 periods/week, Tutorial: 1	Sessional Marks	••	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT-I

(17 periods)

Introduction: Introduction to java, data types, dynamic initialization, scope and life time, operators, control statements, arrays, type conversion and casting, finals & blank finals.

Classes and Objects : Concepts, methods, constructors, usage of static, access control, this key word, garbage collection, overloading, parameter passing mechanisms, nested classes and inner classes.

Inheritance: Basic concepts, access specifiers, usage of super key word, method overriding, final methods and classes, abstract classes, dynamic method dispatch, Object class.

Interfaces: Differences between classes and interfaces, defining an interface, implementing interface, variables in interface and extending interfaces.

Packages: Creating a Package, setting CLASSPATH, Access control protection, importing packages. Strings: Exploring the String class, String buffer class, Command-line arguments.

Library: Date class, Collection, Enumerations and Wrapper classes.

UNIT-II

(18 periods)

Exception Handling: Concepts of Exception handling, types of exceptions, usage of try, catch, throw, throws and finally keywords, Built-in exceptions, creating own exception sub classes.

Multithreading : Concepts of Multithreading, differences between process and thread, thread life cycle, Thread class, Runnable interface, creating multiple threads, Synchronization, thread priorities, inter thread communication, daemon threads, deadlocks, thread groups.

I/O Streams: Streams, Byte streams, Character streams, File class, File streams.

Applets: Concepts of Applets, life cycle of an applet, creating applets, passing parameters to applets, accessing remote applet, Color class and Graphics UNIT-III

(20 periods)

(20 periods)

Event Handling: Events, Event sources, Event classes, Event Listeners, Delegation event model, handling events.

AWT: AWT Components, windows, canvas, panel, File Dialog boxes, Layout Managers, Event handling model of AWT, Adapter classes, Menu, Menu bar.

Swing-I - swings introduction, JApplet, JFrame and JComponent, Icons and Labels, text fields, buttons - The JButton class, Check boxes, Radio buttons.

UNIT-IV

Swing- II: Combo boxes, Tabbed Panes, Scroll Panes, Trees, and Tables.

JDBC Conectivity : JDBC connectivity, types of Jdbc Drivers, connecting to the database, JDBC Statements, JDBC Exceptions, Manipulations on the database, Metadata.

Networking: Basics of Networking, InetAddress, URL, URL connection, TCP/IP sockets, Datagrams, java.net package.

TEXT BOOKS:

- 1. The Complete Reference Java J2SE 7th Edition, Herbert Schildt, TMH Publishing Company Ltd, NewDelhi. (UNTI - I and UNIT - II)
- 2. Big Java 2nd Edition, Cay Horstmann, John Wiley and Sons, Pearson Edu. (UNIT-IV)

REFERENCES:

- Java How to Program, Sixth Edition, H.M.Dietel and P.J.Dietel, Pearson Education/PHI 1.
- Core Java 2, Vol 1, Fundamentals, Cay.S.Horstmann and Gary Cornell, Seventh Edition, 2. Pearson Education.
- 3. Core Java 2, Vol 2, Advanced Features, Cay.S.Horstmann and Gary Cornell, Seventh Edition, Pearson Education.
- 4. Beginning in Java 2, Iver Horton, Wrox Publications.
- 5. Java, Somasundaram, Jaico.
- 6. Introduction to Java programming, By Y.Daniel Liang, Pearson Publication

DATABASE MANAGEMENT SYSTEMS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT - I

(18 Periods)

Databases and Database Users: Introduction - An Example - Characteristics of the Database Approach - Actors on the Scene - Workers behind the Scene - Advantages of Using the DBMS Approach - A Brief History of Database Applications - When Not to Use a DBMS

Database System Concepts and Architecture : Data Models, Schemas, and Instances - Three-Schema Architecture and Data Independence - Database Languages and Interfaces - The Database System Environment - Centralized and Client/Server Architectures for DBMSs - Classification of Database Management Systems

Data Modeling Using the Entity-Relationship (ER) Model : Using High-Level Conceptual Data Models for Database Design - An Example Database Application - Entity Types, Entity Sets, Attributes, and Keys - Relationship Types, Relationship Sets, Roles, and Structural Constraints - Weak Entity Types - Refining the ER Design for the COMPANY Database - ER Diagrams, Naming Conventions, and Design Issues

UNIT - II

(20 Periods)

The Relational Data Model and Relational Database Constraints : Relational Model Concepts - Relational Model Constraints and Relational Database Schemas -Update Operations, Transactions, and Dealing with Constraint Violations -Relational Database Design Using ER-to-Relational Mapping

The Relational Algebra and Relational Calculus : Unary Relational Operations: SELECT and PROJECT - Relational Algebra Operations from Set Theory - Binary Relational Operations: JOIN and DIVISION - Additional Relational Operations - The Tuple Relational Calculus - The Domain Relational Calculus

SQL-99: Schema Definition, Constraints, Queries, and Views : SQL Data Definition and Data Types - Specifying Constraints in SQL - Schema Change Statements in SQL - Basic Queries in SQL - More Complex SQL Queries - INSERT, DELETE, and UPDATE Statements in SQL - Views (Virtual Tables) in SQL

UNIT - III

(18 Periods)

Disk Storage, Basic File Structures: Introduction - Secondary Storage Devices -Buffering of Blocks - Placing File Records on Disk - Operations on Files - Files of Unordered Records (Heap Files) - Files of Ordered Records (Sorted Files) - Types of Single-Level Ordered Indexes - Multilevel Indexes - Dynamic Multilevel Indexes Using B-Trees and B+-Trees - Indexes on Multiple Keys

Functional Dependencies and Normalization for Relational Databases : Informal Design Guidelines for Relation Schemas - Functional Dependencies - Normal Forms Based on Primary Keys - General Definitions of Second and Third Normal Forms, Boyce-Codd Normal Form

Relational Database Design Algorithms and Further Dependencies : Properties of Relational Decompositions - Algorithms for Relational Database Schema Design -Multivalued Dependencies and Fourth Normal Form - Join Dependencies and Fifth Normal Form.

UNIT - IV

Introduction to Transaction Processing Concepts and Theory: Introduction to Transaction Processing - Transaction and System Concepts - Desirable Properties of Transactions - Characterizing Schedules Based on Recoverability - Characterizing Schedules Based on Serializability

Concurrency Control Techniques: Two-Phase Locking Techniques for Concurrency Control - Concurrency Control Based on Timestamp Ordering - Multiversion Concurrency Control Techniques - Validation (Optimistic) Concurrency Control Techniques - Granularity of Data Items and Multiple Granularity Locking

Database Recovery Techniques : Recovery Concepts - Recovery Techniques Based on Deferred Update - Recovery Techniques Based on Immediate Update - Shadow Paging

Database Security : Introduction to Database Security Issues - Discretionary Access Control Based on Granting and Revoking Privileges - Mandatory Access Control

TEXT BOOKS:

1. Fundamentals of Database Systems, Ramez Elmasri and Navate Pearson Education, 5th edition.

REFERENCES:

- 1. Introduction to Database Systems, C.J.Date Pearson Education
- 2. Data base Management Systems, Raghurama Krishnan, Johannes Gehrke, TATA McGrawHill 3rd Edition
- 3. Data base System Concepts, Silberschatz, Korth, McGraw hill, 5th edition.

IT 316

DESIGN AND ANALYSIS OF ALGORITHMS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

UNIT - I

(17 periods)

Introduction: Algorithm Design paradigms - motivation, concept of algorithmic efficiency, run time analysis of algorithms, Asymptotic Notations.

Divide and Conquer: Structure of divide and conquer algorithms: examples, quick sort, Strassen Multiplication; Analysis of divide and conquer run time recurrence relations.

UNIT - II

(20 periods)

Greedy Programming: Overview of the greedy paradigm examples of exact optimization solution, Approximate solution (Knapsack problem) Shortest-Path Algorithms - Unweighted Shortest Paths - Dijkstra's Algorithm - Minimum Spanning Tree - Prim's and Kruskal's algorithms.

Dynamic Programming: Overview, difference between dynamic programming and divide and conquer, Applications: Shortest path in graph, Matrix multiplication, Traveling Salesman Problem, longest Common sequence.

UNIT - III

Graph Searching and Traversal: Overview, Traversal methods (depth first and breadth first search), Applications of DFS - connected components, Bi-connected components.

Back tracking: Overview, 8-queen problem and Knapsack problem.

UNIT - IV

(18 periods)

(15 periods)

Branch and Bound: LC searching Bounding, FIFO branch and bound, LC branch and bound application: 0/1 Knapsack problem, Travelling Salesman Problem.

Computational Complexity: Complexity measures, Polynomical Vs Non-polynomial time complexity; NP-hard and NP-complete classes, examples.

TEXT BOOK:

1. E. Horowitz, S. Sahni and S.Rajsekran, "Fundamentals of Computer Algorithms", Galgotia Publication.

REFERENCE BOOKS:

- 1. T. H. Cormen, Leiserson, Rivest and Stein, "Introduction of Computer Algorithm", PHI.
- 2. Sara Basse, A.V. Gelder, "Computer Algorithms", Addison Wesley.

JAVA PROGRAMMING LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	:	50

- 1. Write a java program to demonstrate static member, static method and static block.
- 2. Write a java program to demonstrate method overloading and method overriding.
- 3. Write a java program to demonstrate finals, blank finals, final methods, and final classes.
- 4. Write a java program to demonstrate synchronous keyword.
- 5. Write a java program to implement multiple inheritance.
- 6. Write a program to demonstrate packages.
- 7. Write a java program to crate user defined exception class and test this class.
- 8. Write am applet program to demonstrate Graphics class.
- 9. Write GUI application which uses awt components like label, button, text filed, text area, choice, checkbox, checkbox group.
- 10. Write a program to demonstrate MouseListener, MouseMotionListener, KeyboardListener, ActionListener, ItemListener.
- 11. Develop swing application which uses JTree, Jtable, JComboBox.
- 12. Write a JDBC Application to implement DDL and DML commands.
- 13. Write a program to implement client/server applications using connection oriented & connection less mechanisms.

CS/IT 352 RDBMS LABORATORY (USING ORACLE: SQL*PLUS, FORMS & REPORT TOOLS)

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

I. Simple queries: selection, projection, sorting on a simple table

- i. Small-large number of attributes
- ii. Distinct output values
- iii. Renaming attributes
- iv. Computed attributes
- v. Simple-complex conditions (AND, OR, NOT)
- vi. Partial Matching operators (LIKE, %, _, *, ?)
- vii. ASC-DESC ordering combinations
- viii. Checking for Nulls

II. Multi-table queries(JOIN OPERATIONS)

- i. Simple joins (no INNER JOIN)
- ii. Aliasing tables Full/Partial name qualification
- iii. Inner-joins (two and more (different) tables)
- iv. Inner-recursive-joins (joining to itself)
- v. Outer-joins (restrictions as part of the WHERE and ON clauses)
- vi. Using where & having clauses

III. Nested queries

- i. In, Not In
- ii. Exists. Not Exists
- iii. Dynamic relations (as part of SELECT, FROM, and WHERE clauses)

IV. Set Oriented Operations

- i. Union
- ii. Difference
- iii. Intersection
- iv. Division
- V. DDL & TCL Commands.
 - i. Creating objects: tables, views, users, sequences, Collections etc.
 - ii. Privilege management through the Grant/Revoke commands
 - iii. Transaction processing using Commit/Rollback
 - iv. Save points.
- VI. PL/SQL Programming I
 - i. Programs using named and unnamed blocks
 - ii. Programs using Cursors, Cursor loops and records
- VII. PL/SQL Programming II
 - i. Creating stored procedures, functions and packages
 - ii. Error handling and Exception
 - iii. Triggers and auditing triggers
- VIII. User Defined Types

 - i. Creating Objectsii. Creating User Defined Operators
- IX. Forms designing
- X. Generating Reports
- XI. Data base creation using schema builder
- XII. Query execution using query builder

TEXT BOOKS:

- 1. Oracle Database 10g The Complete Reference by Kevin Loney, Tata McGraw-Hill Publishing Company Limited.
- 2. Oracle 9i PL/SQL Programming by Scott Urman, Tata McGraw-Hill Publishing Company Limited.
- 3. Simplified Approach to Oracle by Parteek Bhatia, Sanjiv Datta, Ranjit Singh, Kalyani Publishers.

ALGORITHMS LAB

Lectures	 3 periods/week	Sessional Marks		25
University Exam	 3 hours	University Examination Marks	•••	50

- 1. Implement Strassen's Multiplication.
- 2. Implement Dijkstra's Algorithm.
- 3. Implement Prim's Algorithm.
- 4. Implement Kruskal's Algorithm.
- 5. To determine Shortest Path in Multi-stage graph using Forward & Backward approach.
- 6. Implement Traveling Salesman Problem using Dynamic Programming.
- 7. Implement longest common sequence algorithm.
- 8. Implement DFS traversal of a given graph.
- 9. Find the strongly connected components of a graph.
- 10. Find the articulation bi-connected components.
- 11. Implement FIFO branch and bound algorithm for 0/1 Kanpsack problem.
- 12. Implement LC branch and bound algorithm for Traveling Salesman problem.

IT 353

COMPUTER NETWORKS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	:	70

UNIT-I

(16 periods)

INTRODUCTION: Uses of Computer Networks: Business Applications, Home Applications, Mobile Users, Social Issues, **Network Hardware:** LANs, MANs, WANs. **Network Software:** Protocol Hierarchies, Design Issues for the Layers, Connection -Oriented and Connectionless Services, Service Primitives, The Relationship of Services to Protocols.

Reference Models: The OSI Reference Model, The TCP/IP Reference Model.

Example Networks: The Internet, Connection-Oriented Networks (X.25, Frame Relay & ATM), Ethernet.

Network Layer: Network Layer Design Issues: Store-and-Forward Packet Switching, Services Provided to the Transport Layer, Implementation of Connectionless Service, Implementation of Connection-Oriented Service, Comparison of Virtual-Circuit & Datagram Subnets.

Routing Algorithms: The Optimality Principle, Shortest Path, Routing, Flooding, Distance Vector Routing, Link State Routing, Hierarchical Routing, Broadcast Routing, Multicast Routing, Routing for Mobile Hosts.

UNIT-II

(16 periods)

Network Layer(Continued):Congestion Control Algorithms: General Principles of Congestion Control, Congestion Prevention Policies, Congestion Control in Virtual-Circuit Subnets, Congestion Control in Datagram Subnets, Load Shedding, Jitter Control.

Quality of Service: Requirements, Techniques for Achieving Good Quality of Service, Integrated Services, Differentiated Services.

Internetworking: Networks Differences, Connecting Networks, Concatenated Virtual Circuits, Connection less Internetworking, Tunneling, Internetwork Routing, Fragmentation.

The Network Layer in the Internet: The IP Protocol, IP Addresses, Internet Control Protocols, OSPF-The Interior Gateway Routing Protocol, BGP-The Exterior Gateway Routing Protocol, Internet Multicasting, Mobile IP,IPv6.

UNIT-III

(15 periods)

The Transport Layer: The Transport Service: Services Provided to the Upper Layers, Transport Service Primitives, Berkeley Sockets.

Elements of Transport Protocols: Addressing, Connection Establishment, Connection Release, Flow Control and Buffering, Multiplexing, Crash Recovery, Simple transport Protocol.

The Internet Transport Protocol (UDP): Introduction to UDP, Remote Procedure Call, The Real-Time Transport Protocol.

The Internet Transport Protocols (TCP): Introduction to TCP, The TCP Service Model, The TCP Protocol, The TCP Segment Header, TCP Connection Establishment, TCP Connection Release, Modeling TCP Connection Management, TCP Transmission Policy, TCP Congestion Control, TCP Timer Management, Wireless TCP & UDP Transactional TCP.

UNIT-IV

Application Layer: The Domain Name System(DNS): The DNS Name Space, Resource Records, Name Servers. **Electronic Mail**: Architecture & Services, The User Agent, Message Formats, Message Transfer, Final Delivery.

The World Wide Web: Architectural Overview, Static Web Documents, Dynamic Web Documents, HTTP - Hyper Text Transfer Protocol, Performance Enhancements.

Multimedia: Introduction to Digital Audio, Audio Compression, Streaming Audio, Internet Radio, Voice over IP, Introduction to Video, Video Compression, Video on Demand, The MBone - The Multicast Backbone.

TEXT BOOK:

1. Tanenbaum, "Computer Networks", 4th Edition, (Pearson Education / PHI).

REFERENCE BOOKS:

- 1. Kurose & Ross, "Computer Networks" A Top-down approach featuring the Internet", Pearson Education Alberto Leon Garciak.
- 2. Leon-Gartia, Indra Widjaja, "Communication Networks Fundamental Concepts and Key Architectures", TMH.
- 3. Nader F.Mir, "Computer and Communication Networks", PHI

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COMPILER DESIGN

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT - I

Introduction to compiling: Compilers. The Phases of a compiler.

Simple one-pass compiler: Overview, syntax definition, syntax direct translation, parsing, a translator for simple expressions.

Lexical Analysis: The role of the lexical analyzer, input buffering, simplification of tokens, Recognition of tokens, implementing transition diagrams, a language for specifying lexical analyzers.

Syntax analysis: Top down parsing - Recursive descent parsing, Predictive parsers.

UNIT - II

Syntax Analysis: Bottom up parsing - Shift Reduce parsing, LR Parsers - Construction of SLR, Canonical LR and LALR parsing techniques, Parser generators - Yacc Tool.

Syntax - Directed Translation: Syntax Directed definition, construction of syntax trees, Bottom-up evaluation of S - attributed definitions.

UNIT - III

Runtime Environment: Source language issues, Storage organization, Storage-allocation strategies, Access to nonlocal names, Parameter passing..

Symbol Tables: Symbol table entries, Data structures to symbol tables, representing scope information.

UNIT - VI

Intermediate code Generation: Intermediate languages, Declarations, Assignment statements, Boolean expressions, Backpatching.

Code Generation- Issues in the design of code generartor, the target machines, Basic blocks and flow graphs. Next use information. A simple code generator

Text Books:

1. Alfred V.Aho, Ravi Sethi, JD Ullman, 'Compilers Principles, Techniques and Tools', Pearson Education, 2007.

References:

- 1. Alfred V.Aho, Jeffrey D. Ullman, 'Principles of Compiler Design', Narosa publishing
- 2. Lex & Yacc John R. Levine, Tony Mason, Doug Brown, O'reilly
- 3. Modern Compiler Implementation in C- Andrew N. Appel, Cambridge University Press.
- 4. Engineering a Compiler-Cooper & Linda, Elsevier.
- 5. Compiler Construction, Louden, Thomson..

(16 periods)

(18 periods)

(15 periods)

(17 periods)

CS/IT 322

WEB TECHNOLOGIES (REVISED)

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70
Unit I Introduct Cascadin JavaScrip Control S Control S Function Arrays Objects	cion g Si ot: tat tat	to XHTML tyle Sheets (CSS) Introduction to Scripting ements, Part 1 ements, Part 2	(16 perio	ods)	
Unit II			(18 perio	ods)	
DOM: Ob Java Scri XML & RS	jec pt: SS (t Model and Collections Events Really Simple Syndication)	(,,	
Unit III			(16 perio	ods)	
Ajax-Ena Web Serv Ruby on Unit IV JavaServ Ajax ena Web Serv	ble vers Rail er I ble vice	d Rich Internet Applications (IIS and Apache) s Faces Web Applications d JavaServer Faces Web Applic	(20 perio	ods)	

Text Books:

Harvey M. Deitel and Paul J. Deitel, "Internet & World Wide Web How to Program", 4/e, Pearson Education.

References:

- 1. Jason Cranford Teague "Visual Quick Start Guide CSS, DHTML & AJAX", 4e, "Pearson Education.
- 2. Tom Nerino Doli smith "JavaScript & AJAX for the web" Pearson Education 2007.
- 3. Joshua Elchorn "Understanding AJAX" Prentice Hall 2006.
- 4. Hal Fulton "The Ruby Way", 2e, Pearson Education 2007.
- 5. David A. Black "Ruby for rails" Dreamtech Press 2006.
- 6. Bill Dudney, Johathan lehr, Bill Willies, Lery Mattingly "Mastering Java Server Faces" Wiely India 2006.

WEB TECHNOLOGIES (EXISTING)

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70
Unit I Introduct Cascadin JavaScrip Control S Control S Functions Arrays Objects	tion g St tat tat	to XHTML cyle Sheets (CSS) Introduction to Scripting ements, Part 1 ements, Part 2	(16 perio	ods)	
Unit II Dynamic Dynamic XML, RSS	HT HT (Re	ML: Object Model and Collecti ML: Event Model eally Simple Syndication)	(18 peric ons	ods)	
Unit III Building / Web Serv Ruby and	Aja rers Ru	x-Enabled Web Applications (IIS and Apache) by on Rails	(16 perio	ods)	
Unit IV JavaServo JavaServo Web Servo	er F er F 'ice	Faces Web Applications: Part 1 Faces Web Applications: Part 2 s	(20 perio	ods)	

Text Books:

Harvey M. Deitel and Paul J. Deitel, "Internet & World Wide Web How to Program", 4/e, Pearson Education.

References:

- 1. Jason Cranford Teague "Visual Quick Start Guide CSS, DHTML & AJAX", 4e, "Pearson Education.
- 2. Tom Nerino Doli smith "JavaScript & AJAX for the web" Pearson Education 2007.
- 3. Joshua Elchorn "Understanding AJAX" Prentice Hall 2006.
- 4. Hal Fulton "The Ruby Way", 2e, Pearson Education 2007.
- 5. David A. Black "Ruby for rails" Dreamtech Press 2006.
- 6. Bill Dudney, Johathan lehr, Bill Willies, Lery Mattingly "Mastering Java Server Faces" Wiely India 2006.

CREATING AN ARCHITECTURAL DESIGN:

Design within the Context of Software Engineering, Design Process and Design Quality,

Design Concepts The Design Model, Pattern Based Software Design.

Software Architecture, Data Design, Architectural Styles and Patterns, Architectural Design, Assessing Alternative Architectural Designs, Mapping Data Flow into Software Architecture.

INTRODUCTION TO SOFTWARE ENGINEERING:

3 hours

:

The Evolving Role of Software, Software, The Changing Nature of Software, Legacy Software, Software Myths.

A GENERIC VIEW OF PROCESS:

Software Engineering - A Layered Technology, A Process Framework, The CMMI, Process Patterns, Process Assessment, Personal and Team Process Models, Process Technology, Product and Process.

PROCESS MODELS:

Prescriptive Models, The Waterfall Model, Incremental Process Models, Evolutionary Models, Specialized Process models, The Unified Process.

AN AGILE VIEW OF PROCESS:

What Is Agility?, What Is an Agile Process?, Agile Process Models.

4 periods/week, Tutorial: 1

UNIT-II

SOFTWARE ENGINEERING PRACTICE:

Software Engineering Practice, Communication Practices, Planning Practices, Modeling Practices, Construction Practice, Deployment.

SYSTEM ENGINEERING:

Computer-Based Systems, The System Engineering Hierarchy, **Business** Process Engineering: An Overview, Product Engineering: An Overview, System Modeling.

REOUIREMENTS ENGINEERING:

A Bridge To Design and Construction, Requirements Engineering Tasks, Initiating the Requirements Engineering Process, Eliciting Requirements, Developing Use-cases, Building the Analysis Model, Negotiating Requirements, Validating Requirements.

BUILDING THE ANALYSIS MODEL:

Requirements Analysis, Analysis Modeling Approaches, Data Modeling Concepts, Flow-Oriented Modeling, Class Based Modeling Creating a Behavioral Model.

UNIT -III

DESIGN ENGINEERING:

CS/IT 324

University Exam

Lectures

UNIT-I

SOFTWARE ENGINEERING

Sessional Marks

University Examination Marks

(17 pariods)	

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(18 periods)

(17 periods)

(15 periods)

30 :

70

:

70

MODELING COMPONENT-LEVEL DESIGN:

What Is a Component?, Designing Class-Based Components, Conducting Component-Level Design, Object Constraint Language, Designing Conventional Components.

PERFORMING USER INTERFACE DESIGN:

The Golden Rules, User Interface Analysis and Design, Interface Analysis, Interface Design Steps, Design Evaluation

UNIT-IV

(20 periods)

SOFTWARE PROCESS AND PROJECT METRICS:

Introduction: Metrics Process and Project Domains, Software Measurement, Metrics for Software Quality, Integrating Metrics with Process, Statistical Quality Control, Metrics for Small Organizations, Establishing a Software Metrics Programming.

SOFTWARE QUALITY ASSURANCE:

Quality Concepts, Quality Movement, SQA, Software Reviews, Formal Technical Reviews, Formal Approaches to SQA, Software Reliability, ISO 9000 Quality Standards, SQA Plan.

SOFTWARE TESTING STRATEGIES:

Strategic Approach, Strategic Issues, Test strategies for Conventional Software, Test strategies for Object Oriented Software, Validation Testing, System Testing, The Art of Debugging.

TESTING TACTICS:

Software Testing Fundamentals, Black-Box and White-Box Testing, White-Box Testing, Basis Path Testing, Control Structure Testing, Black-Box Testing, Object-Oriented Testing Methods, Testing for Specialized Environments, Architectures, and Applications, Testing patterns

PRODUCT METRICS:

Software Quality, A Framework for Product Metrics, Metrics for the Analysis Model, Metrics for the Design Model, Metrics for Source Code, Metrics for Testing, Metrics for Maintenance.

Textbooks:

1) Roger S.Pressman, 'Software Engineering- A Practitioner's Approach', Sixth Edition, McGraw- Hill International.

Reference Books:

- 1. Ian Sommerville, 'Software Engineering', Sixth Edition, Pearson Education.
- 2. Carlo Ghezzi, Mehdi Jazayeri, Dino Mandrioli, 'Fundamentals of Software Engineering', Second Edition, PHI.
- 3. RajibMall, 'Fundamentals of Software Engineering', Second Edition, PHI.

IT 325

ADVANCED UNIX PROGRAMMING

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I

(18 periods)

Introduction to unix : Unix architecture , Features of Unix, Vi editor.

Directory Related utilities- pwd, mkdir, ls, cd , rmdir.

File Handling and Text Processing utilities- cp, mv, rm, ln, unlink, lp, cat, more, pg, head, tail, sort ,nl, grep, egrep, fgrep,cut, paste, join, tee, w ,chgrp, chmod, chown, find, cmp, diff, uniq, tr.

Disk utilities, Backup and other utilities- du, df, mount, unmount, umask, ulimit, tar, cpio, dump, who, mail, compress, uncompress, gzip, gunzip, crypt, sed, tty,

Networking utilities - finger, telnet, rlogin, ftp, rcp, write, talk, wall.

Programmable text processing: awk - awk programs, accessing individual fields, Begin and end, operators, variables, control structures, extended regular expressions, condition Ranges, field separators, Build - in functions.

UNIT-II

(20 periods)

Bourne Shell programming: Shell, functions of the shell, Meta characters, Input redirection, Output redirection, pipes, shell as programming language, shell variables, predefined local variables, predefined environment variables, Arithmetic, conditional expressions, control structures, positional parameters, passing command line arguments, Built - in Shell commands and shell programs.

Unix Internals: Kernel Basics, File System, Process Management.

UNIT-III

(18 periods)

File management system calls : Regular file management system calls - open(), read(), write(), lseek(), Close(),unlink(),stat(), getdents(). Miscellaneous file management system calls - chown() and fchown(), chmod() and fchmod(), dup() and dup2(), fcntl(), ioctl(), link(), mknod(), sync(), truncate() and ftruncate().

Process Management: Creating a new process - fork(),orphan processes, terminating a process - exit(), zombie processes, waiting for child - wait(), Differentiating a process - exec(), changing directories - chdir(), changing priorities- nice(), Accessing user and Group ID's , file locking - deadlocks.

UNIT IV

(18 periods)

Signals: The defined signals, A list f signals, terminal signals, Requesting on Alarm signal - alarm(), handling signals - signal(), protecting critical code and chaining interrupt handlers, sending signals - kill(), Death of children, suspending and Resuming processes, process Group's and control terminals.

Inter process communication: Pipes, Sockets, shared memory, semaphores.

Text Book:

1 "Unix for programmers and users" 3rd edition by Graham Glass, King Ables, pearson education .

Reference Books:

- 1. "Advanced programming in the unix environment" w- Richard Stevens 2nd Edition Pearson education
- 2. "Unix programming environment", Kernighan and pike, Pearson education.
- 3. "Your unix the ultimate guide" Sumitabha Das, TMH 2nd edition.
- 4. "Advanced unix programming" by Marc J. Rochkind, 2nd edition Pearson Education.

University Examination Marks

ARTIFICIAL INTELLIGENCE

UNIT-I

Lectures

PROBLEMS, PROBLEM SPACES AND SEARCH

:

:

Defining the Problem as a State Space Search - Production Systems - Problem Characteristics - Production System Characteristics - Issues in the Design of Search Programs. HEURISTIC SEARCH TECHNIQUES

Generate-and-Test - Hill Climbing - Best-First Search - Problem Reduction - Constraint Satisfaction - Means-Ends Analysis.

UNIT-II

KNOWLEDGE REPRESENTATION USING PREDICATE LOGIC

4 periods/week

3 hours

Representing Simple Facts in Logic - Representing Instance and ISA Relationships - Computable Functions and Predicates - Resolution.

REPRESENTING KNOWLEDGE USING RULES

Procedural versus Declarative Knowledge - Logic Programming - Forward Versus Backward Reasoning - Matching - Control Knowledge.

UNIT-III

SLOT - AND - FILLER STRUCTURES

Semantic Nets - Conceptual Dependency - Scripts.

PLANNING

Overview - An Example Domain: The Blocks Word - Component of Planning Systems - Goal Stack Planning - Non-linear Planning using constraint posting - Hierarchical planning - Reactive systems.

UNIT-IV

LEARNING

What is learning? - Rote learning - Learning by taking advice - Learning in problem solving - Learning from example: Induction - Explanation Based Learning.

EXPERT SYSTEMS

Representing and using domain knowledge - Expert system shells - Explanation - Knowledge Acquisition.

Textbooks:

1. Elaine Rich & Kevin Knight, 'Artificial Intelligence', 2nd Edition, (Tata McGraw Hill Edition)

Reference Books:

- 1. Patrick Henry Winston, 'Artificial Intelligence', Pearson Education,
- 2. Russel and Norvig, 'Artificial Intelligence', Pearson Education/ PHI

(18 periods)

(13 periods)

(15 periods)

(14 periods)

30

: 70

:

Sessional Marks

CS/IT 326(A)

University Exam

CS/IT 326(B) ADVANCED DATABASE MANAGEMENT SYSTEMS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks		70

UNIT-I

(14 Periods)

Algorithms for Query Processing and Optimization : Translating SQL queries into relational algebra-algorithms for external sorting-algorithms for select and join operations-algorithms for project and set operations-implementing aggregate operations and outer joins-combining operations using pipelining-using heuristics in query optimization

Data base systems architecture and the system Catalog : System architectures for DBMSs, Catalogs for Relational DBMSs, System catalog information in oracle.

Practical database design and tuning : Physical Database Design in Relational Databasesan overview of Database Tuning in Relational systems

UNIT-II

(16 Periods)

Distributed DBMS Concepts and Design : Introduction-function and architecture of a Distributed DBMS-Distributed Relational Database Design-transparencies in a Distributed DBMS-Date's Twelve Rules for Distributed DBMS

Distributed DBMS-Advanced Concepts : Distributed Transaction Management-Distributed Concurrency Control-Distributed Deadlock Management-Distributed Database Recovery-The X/Open Distributed Transaction processing model-Replication Servers

UNIT-III

(19 Periods)

Introduction to Object DBMSs : Advanced Database Applications-Weaknesses of RDBMSs-Object oriented Concepts-Storing objects in a Relational Database-Next generation Database systems

Object-Oriented DBMSs-Concepts and Design : Introduction to Object-Oriented Data Models and DBMSs-OODBMS perspectives-Persistence-Issues in OODBMSs-The object Oriented Database System Manifesto-Advantages and Disadvantages of OODBMSs-Object oriented Database Design

Object-Oriented DBMSs-Standards and Systems : Object management group-Object Database Standard ODMG3.0, 1999-Object store

Object relational DBMSs : Introduction to Object-relational Database systems-the third generation Database manifesto-Postgres-an early ORDBMS-SQL3

UNIT-IV

(13 Periods)

Emerging database technologies and applications : Mobile databases-multimedia databases-geographic information systems-genome data management

XML and Internet Databases : Structured, semi structured, and unstructured data-XML Hierarchical (Tree) Data model-XML documents, DTD and XML Schema-XML Documents and Databases-XML querying

Enhanced data models for advanced applications : Active database concepts and triggers-temporal database concepts-multimedia databases-introduction to deductive databases

Text Books:

1. Database Systems: A practical approach to design, implementation and management-thomas m Connolly and Carolyn E.begg

2. Fundamentals of Database Systems, Elmasri Navrate, 5/e, Pearson Education. References:

1. Principles of Distributed Database Systems, Ozsu, 2/e, PHI.

CS/IT 326 (C)

OPERATIONS RESEARCH

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I

(15 periods)

LINEAR PROGRAMMING :Definition and Scope of Operations Research, Mathematical formulation of the problem, graphical method, Simplex method, artificial basis technique, dual Simplex method. Degeneracy, alternative optima, unbounded solution, infeasible solution.

UNIT II

(15 periods)

TRANSPORTATION PROBLEM: Introduction to the problem, LP formulation of a transportation problem. Basic feasible solution by north-west corner method, Vogel's approximation method, least cost method. Finding optimal solution by MODI method, degeneracy, unbalanced transportation matrix and Maximization in transportation model.

THEORY OF GAMES: Introduction, rectangular two person zero sum games, solution of rectangular games in terms of mixed strategies, solution of 2x2 games without saddle point, concept of dominance to reduce the given matrix, Graphical method for 2xn and mx2 games.

UNIT III

INVENTORY CONTROL: Introduction, EOQ with uniform rate of demand, Economic lot size with finite rate of replenishment, Quantity discounts, ABC analysis of inventory.

DYNAMIC PROGRAMMING: Introduction, Characteristics of D.P. model, the recursive equation approach, Computational Procedure in dynamic Programming, solution of an L.P. by D.P.

UNIT IV

(15 periods)

(15 periods)

PROJECT PLANNING THROUGH NETWORKS: Introduction, Basic steps in PERT/CPM techniques, Network diagram presentation, Rules of drawing network diagram, Fulkerson's rule, Time estimates and Critical path in network analysis, Project evaluation and review technique, Application areas of PERT/CPM techniques.

SIMULATION: Introduction, Monte-carlo Simulation, Application to Inventory Control, Application to Queuing Problems.

Textbooks :

- 1. SD Sharma, 'Operations Research (Units: I, IV) Kedarnath, Ramnath & Co., Meerut.
- 2. BS Goel & S.K.Mithal, 'Operations Research (Units: II,III)' Pragati Prakasham, Meerut.

Reference Books :

- 1. Kanthi Swarup, PK Gupta & Manmohan, 'Operations Research' Sultanchand & Sons, New Delhi.
- 2. Operations Research Gupta and Hira
- 3. Pert and CPM Principles and Applications L.S. Srinath

⁷⁶ A.N.U B.Tech (IT) w.e.f. 2007-08

REAL-TIME SYSTEMS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

UNIT - I

CS/IT 326(D)

Typical Real-Time applications, Hard versus Soft Real-Time systems, A reference model of Real-Time Systems.

UNIT - II

Commonly used approaches to Real-Time scheduling, Clock-Driven scheduling, Pros and Cons of Clock-driven scheduling.

UNIT - III

Priority-Driven scheduling of Periodic tasks: static assumption, Fixed-Priority versus Dynamic-Priority algorithms, Optimality of the RM and DM algorithms, A schedulability test for Fixed-Priority tasks with short response times and arbitrary response times, sufficient schedulability conditions for the RM and DM algorithms;

Scheduling Aperiodic and Sporadic jobs in priority-Driven systems: Deferrable Servers, Sporadic Servers, Constant Utilization, Total Bandwidth and weighted Fair-Queuing Servers, Scheduling of sporadic Jobs.

UNIT - IV

Resources and Resources Access Control, Scheduling Flexible computations and tasks with temporal distance constraints.

Text book:

Jane W.S.Liu, 'Real-Time Systems', Pearson Education Asia.

Reference books:

C.M.Krishna and G.Shin, 'Real-Time Systems', Tata McGraw Hill Co. Inc., 1997.

(17 periods)

(15 periods)

(18 periods)

(15 periods)

⁷⁷ A.N.U B.Tech (IT) w.e.f. 2007-08

SOFT COMPUTING

Lectures	:	4 periods/week	Sessional Marks	••	30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

ARTIFICIAL NEURAL NETWORKS

Basic concepts - Single layer perception - Multilayer Perception - Supervised and Unsupervised learning - Back propagation networks - Kohnen's self organizing networks - Hopfield network.

UNIT - II

FUZZY SYSTEMS

Fuzzy sets and Fuzzy reasoning - Fuzzy matrices - Fuzzy functions - Decomposition - Fuzzy automata and languages - Fuzzy control methods - Fuzzy decision making.

NEURO - FUZZY MODELING

Adaptive networks based Fuzzy interface systems - Classification and Regression Trees - Data clustering algorithms - Rule based structure identification - Neuro-Fuzzy controls - Simulated annealing - Evolutionary computation.

UNIT - III

GENETIC ALGORITHMS

Survival of the Fittest - Fitness Computations - Cross over - Mutation - Reproduction - Rank method - Rank space method.

UNIT - IV

SOFTCOMPUTING AND CONVENTIONAL AI

Al search algorithm - Predicate calculus - Rules of interference - Semantic networks - Frames - Objects - Hybrid models - Applications.

Text Book:

1. Jang J.S.R., Sun C.T. and Mizutani E, "Neuro-Fuzzy and Soft computing", Prentice Hall 1998.

References:

- 1. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw Hill, 1997.
- 2. Laurene Fausett, "Fundamentals of Neural Networks", Prentice Hall, 1994.
- 3. George J. Klir and Bo Yuan, "Fuzzy sets and Fuzzy Logic", Prentice Hall of India.
- 4. Nih J.Nelsson, "Artificial Intelligence A New Synthesis", Harcourt Asia Ltd., 1998.
- 5. D.E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, NY, 1989.

(17 periods)

(18 periods)

(15 periods)

(15 periods)

IT 326 (E)

CS/IT 326(F)

PRINCIPLES OF PROGRAMMING LANGUAGES

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam		3 hours	University Examination Marks		70

UNIT-I

(17 periods)

Preliminaries : Reasons, Programming Domains, Language: Evolution Criteria, Categories, Design Trade-offs, Implementation, Programming Environments,

Evolution of Programming Languages.

Describing syntax and Semantics : General Problems, Describing Syntax, Recursive Descent Parsing, Attribute Grammar, Dynamic Semantics.

Primitive data types and variables: Names, variables, Concept of Binding, Type checking, Strong typing, Type compatibility, Named Constants, Variable Initialization.

UNIT-II

(18 periods)

Scope and Extent : Scope, Scope and Life Time, Referencing Environments. Data Types : Primitive, character string, User-defined, Array, Associative Arrays, Record, Union, Set, Pointer.

Expression and the Assignment Statement : Arithmetic Expressions, Overloading, Type Conventions, Relational and Boolean, Short Circuit, Assignment, Mixed mode Assignment.

Statement level Control Structures: Compound, Selection, Iterative Statements, Unconditional Branching, Guarded Commands.

UNIT-III

(15 periods)

Subprograms: Fundamentals, Design Issue, Local Referencing Environment, Parameter Passing, Parameters that are sub-program names, Overloaded Subprograms, Generic, Separate and Independent Compilation, Design Issues for functions, Non-local environments, User Defined Overloaded Operators, Co routines.

Implementing Subprograms : Fortran 77, Algol-like languages, Blocks, Dynamic Scoping, Implementing Parameters that are sub-program names.

Data Abstraction : Concepts, Encapsulation, Data, Introduction, Design Issues, Examples, Parameterized Abstract Data Types.

UNIT-IV

(15 periods)

Symmetric and Concurrent Subprograms: Support for Object Oriented Programming, Design Issues, Smalltalk, Support for Object Oriented Programming in ; C++, Java, ADA 95, Implementation

Concurrency : Sub-program level, Semaphores, Monitors, Message Passing, Concurrency in ADA 95, Java Threads, Statement level concurrency.

Exception handling : Introduction, Exception Handling in : PL1, ADA, C++, Java.

Textbook:

1. Robert W.Sebesta, 'Concepts of Programming Languages', Addison Wesley Longman Inc., 199.

Reference Books:

- 1. Ellis Horowitz, 'Fundamentals of Programming Languages', Galgotia Publications (P) Ltd., 1994.
- 2. Pratt Terrence.W, 'Programming Languages, Design & Implemented' Prentice Hall of India, 1993.

TERM PAPER

Lectures	:	3 periods/week	Sessional Marks	:	50
University Exam	:		University Examination Marks	:	

It is aimed as a precursor to the project work done in the second semester of the final year B.Tech. It should help the students to identify their Research area / topic and should form the groundwork and preliminary research required for the project work. The batches formed for pursuing the Project Work in the Final Year shall select some research article published in the latest journals of IEEE, ACM and other related journals. Each batch should refer to a minimum of FIVE reference sources outside their prescribed textbooks. The batch must gain an understanding of the research tools used and the related material, available both in printed and digital formats. Each project batch must make the presentation for two rounds on the same research article about their understanding, conclusion and if possible propose the extensions for the work. Each individual of the batch must give the presentation in both the rounds.

At the end of the Semester, the batch must submit a report in IEEE format, on the work they have pursued throughout the Semester containing

The aim and objective of the study.

The Rationale behind the study.

The work already done in the field and identified.

Hypothesis, experimentation and discussion.

Conclusion and further work possible.

Appendices consisting of Illustrations, Tables, Graphs etc.,

Evaluation is to be done for the two presentations made and the report submitted.

Method of Evolution:	1. Day to day work	-	10 marks
	2. Seminar - I	-	10 marks
	3. Term Paper Report	-	15 marks
	4. Seminar - II	-	15 marks
	TOTAL	-	50 marks

CS/IT 362 WEB TECHNOLOGIES

Lectures	:	3 periods/week	Sessional Marks		25
University Exam	:	3 hours	University Examination Marks	•••	50

- 1. Write codes different types of styles in CSS.
- 2. Write java scripts covering Function, recursive functions, Arrays and Objects.
- 3. Demonstrate collection objects.
- 4. Demonstrate event model.
- 5. Write well-formed and valid XML documents.
- 6. Write code for displaying XML using XSL.
- 7. Demonstrate Document Object Model for an XML document.
- 8. Programs on Ruby & Ruby on Rail.
- 9. Develop a web application using JSF.
- 10. Application on Web Services.
ADVANCED UNIX LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

LABCYCLE I: (Working with Commands and Shell Programming)

- 1. Working with different Unix commands, Pipes, I/O redirection.
- 2. Write Shell Programs for the following
 - a) Display all the words which are entered as command line arguments.
 - b) Changes Permissions of files in PWD as rwx for users.
 - c) To print the list of all sub directories in the current directory.
 - d) Program which receives any year from the keyboard and determine whether the year is leap year or not. If no argument is supplied the current year should be assumed.
 - e) Program which takes two file names as arguments, if their contents are same then delete the second file.
- 3. Write shell scripts for the following
 - a) To print the given number in the reversed order.
 - b) To print first 25 Fibbonacci numbers.
 - c) To print the Prime numbers between the specified range.
 - d) To print the first 50 Prime numbers.
- 4. Write shell scripts for the following
 - a) To delete all lines containing the word 'unix' in the files supplied as arguments.
 - b) Menu driven program which has the following options.
 - i) contents of /etc/passwd
 - ii) list of users who have currently logged in.
 - iii) present working directory. iv) exit.
 - c) For sorting, searching and insertion, deletion of elements in the list

LABCYCLE II: (Working with Programs using System Calls)

- 1. Program to transfer the data from one file to another file by using un-buffered I/O.
- 2. Program to create two processes to run a loop in which one process adds all even numbers and the other adds all the odd numbers (Hint: use fork ()).
- 3. Program to create to process 'i' and sends data to process 'j', prints the same after receiving it. (Hint: use vfork()).
- 4. Program to demonstrates orphan process .
- 5. Program which demonstrates how to avoid Zombie using wait().
- 6. Program which demonstrates deadlock between two processes.
- 7. Programs on Inter process communication using pipes and shared memory.
- 8. Create a semaphore operation on a shared file for write but not read.
- 9. Client/Server Socket Programming.

IT 363

IT 411

E - COMMERCE & ERP

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	:	70

UNIT I

(12 periods)

- 1. Introduction to e-commerce and e-marketplaces: Overview of e-commerce Emarketplaces: Structure, Mechanism and Impacts
- 2. Internet Consumer Retailing: Retailing in e-commerce -- Products and Services; Customer Relationship Management (CRM), online advertising.

UNIT II

(18 periods)

- 3. B2B e-commerce: company centric B2B and e-procurement, public B2B exchanges and portals, e-supply chains, collaborative commerce, and intra business EC
- 4. Support Services: Auctions, e-commerce security, electronic payment systems, order fulfillment, content management and other support services.

UNIT III

(18 periods)

- 5. Other EC models and applications: e-government, e-learning, and other EC applications, mobile commerce and pervasive computing.
- 6. Agent Technology: software agents, multi-agent systems, shopping agents.
- 7. Middle agents and Mobile Agents: middle agents, mobile agents, trust and security.

UNIT IV

(17 periods)

- 8. Introduction, Enterprise Resource Planning, the implementation challenge.
- 9. Company-Wide Implementation: Software, Project launch, Sales and operations planning, data integrity, going on the air—supply chain integration, ERP examples.

TEXT BOOKS:

- 1. e-commerce 2004: a managerial perspective -- Efraim Turban, David King, Jae Lee and Dennis Viehland, Pearson education.(Unit I,II,III)
- 2. ERP : Making It Happen : The Implementers Guide to Success with enterprise resource planning Thomas F.Wallace, Michael H. Kremzar, Wiley publications, august 2001.(Unit IV)

REFERENCES:

- 1. Agent Technology for e-commerce Maria Fasli, Wiley Publications, March 2007.
- 2. Frontiers of e-commerce Ravi Kalakota, Andrew B.Whinston, Pearson education.
- 3. E-commerce: business, technology, society Kenneth C. Laudon, Carol Guercio Traver.
- 4. Introduction to Information Systems: Essentials for the e-business enterprise 11th edition James A.O'Brien.
- 5. e-business and ERP Rapid implementation and project planning Morrell G. Shields, May 2001, Wiley publications.
- 6. ERP A Managerial Perspective, By SADAGOPAN, S. Tata McGraw-Hill.

4 periods/week Sessional Marks University Examination Marks

SECURITY IN COMPUTING

UNIT-I

Lectures

University Exam

THE SECURITY PROBLEMS IN COMPUTING:

:

3 hours

Introduction, Attacks, The Meaning of Computer Security: Security Goals, Vulnerabilities. Computer Criminals: Amateurs, Crackers, Career Criminals.

Methods of Defense: Controls, Effectiveness of Controls,

PROGRAM SECURITY: Secure Programs, Non malicious Program Errors, Viruses and Other Malicious Code, Targeted Malicious Code, Controls Against Program Threats.

UNIT-II

Methods of Protection, Memory and Address Protection, Control Of Access to General

(18 periods)

Objects, File Protection Mechanisms, User Authentication. DESIGNING TRUSTED OPERATING SYSTEMS: Introduction, Security Policies, Models Of Security, Trusted Operating System design, Assurance in Trusted Operating Systems.

PROTECTION IN GENERAL -PURPOSE OPERATING SYSTEMS: Protected Objects and

UNIT-III

DATABASE SECURITY: Security Requirements, Reliability and Integrity, Sensitive Data, Inference, Multilevel Databases, Proposals for Multilevel Security.

SECURITY IN NETWORKS: Threats in Networks, Network Security Controls, Firewalls, Intrusion Detection Systems, secure E-Mail

UNIT-IV

(13 periods)

ADMINISTERING SECURITY: Security Planning, Risk Analysis, Organizational Security Policies, Physical Security.

LEGAL, PRIVACY, AND ETHICAL ISSUES IN COMPUTER SECURITY:

Protecting Programs and Data copyrights, Information and the Law, Rights of Employees and Employers, Software Failures, Computer Crime, Privacy, Ethical Issues in Computer Security.

TEXT BOOK:

⊿th Charles P.Pleeger, Shari Lawrence P.Fleeger, "SECURITY IN COMPUTING" 1. edition (Pearson/PHI).

REFERENCE BOOK:

Matt Bishop, "Computer Security - Art & Science", 1/e, Pearson Education, 2003. 1.

IT 412

(17 periods)

70 : (12 periods)

30 :

CS/IT 413 OBJECT ORIENTED ANALYSIS AND DESIGN

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

(25 periods)

What is Object-Orientation: Basic Concepts, The Origins of ObjectOrientation, Object-Oriented Languages Today;

Agate Ltd Case Study - Introduction to Agate Ltd.

Modelling Concepts: Models and diagrams, Drawing Activity Diagrams, A Development Process;

Requirements Capture: User Requirements, Fact Finding Techniques, User Involvement, Documenting Requirements, Use Cases, Requirements Capture and Modelling; **Agate Ltd Case study** - Requirements Model.

Requirements Analysis: What Must a Requirements Model Do?, Use Case Realization, The Class Diagram, Drawing a Class Diagram, CRC Cards, Assembling the Analysis Class Diagram.

Agate Ltd Case study - Requirements Analysis .

UNIT - II

(15 periods)

Refining the Requirements Model: Component based development, Adding further structure, Software development patterns.

Object Interaction: Object Interaction and Collaboration, Interaction Sequence Diagrams, Collaboration Diagrams, Model Consistency;

Specifying Operations: The Role of Operation Specifications, Contracts, Describing Operation Logic, Object Constraint Language, Creating an Operation Specification;

Specifying Control: States and Events, Basic Notation, Further Notation, Preparing a Statechart, Consistency Checking, Qualify Guidelines;

Agate Ltd Case study - Further Analysis

UNIT -III

(16 periods)

Moving Into Design: How is Design Different from Analysis?, Logical and Physical Design, System Design and Detailed Design, Qualities and objectives of Analysis and Design, Measurable Objectives in Design, Planning for Design.

System Design: The Major Elements of System Design, Software Architecture. Concurrency, Processor Allocation, Data Management Issues, Development Standards, Prioritizing Design Trade-offs, Design for Implementation;

Object Design: Class Specification, Interfaces, Criteria for Good Design, Designing Associations, Integrity Constraints, Designing Operations, Normalization;

Design Patterns: Software Development Patterns, Documenting Patterns-Pattern Templates, Design Patterns, How to Use Design Patterns, Benefits and Dangers of Using Patterns;

Human-Computer Interaction: The User Interface, Approaches to User Interface Design, Standards and legal Requirements;

UNIT-IV

(14 periods)

Designing Boundary Classes: The Architecture of the Presentation Layer, Prototyping the User Interface, Designing Classes, Designing Interaction with Sequence Diagrams, The Class Diagram Revisited, User Interface Design Patterns, Modelling the Interface Using Statecharts; Agate Ltd Case Study - Design

Implementation: Software Implementation, Component Diagrams, Development Diagrams, Software Testing, Data Conversion, User Documentation and Training, Implementation Strategies, Review and Maintenance;

Reusable Components: Why Reuse?, Planning a Strategy for Reuse, Commercially Available Componentware;

Managing Object-Oriented Projects: Resource Allocation and Planning, Managing Iteration, Dynamic Systems Development Method, Extreme Programming, Software Metrics, Process Pattems, Legacy Systems, Introducing Object Oriented Technology;

Text Book:

1. Object-Oriented Systems Analysis And Design Using UML - Simon Bennett, Steve McRobb and Ray Farmer - Tata McGraw-Hili Edition - Second Edition

Reference Books :

- 1. James Rumbaugh, Jacobson, Booch, 'Unified Modeling Language Reference Manual', PHI.
- 2. Jacobson et al., 'The Unified Software Development Process', AW, 1999.
- 3. Atul Kahate, Object Oriented Analysis & Design, The McGraw-Hill Companies, 2004.

CS/IT-414

ENTERPRISE PROGRAMMING

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70
UNIT - I J2EE Overview Multi-Tier Architecture Best Practices Design Patterns and Frame Works Java and XML			(16 perio	ds)	
UNIT - II Java Servlets Java Server Pages Enterprise JavaBeans			(20 perio	ds)	
UNIT - III Java Mail API Java Interface Definition Language and CORBA Java Remote Method Invocation Java Message Service Java Message Service Java Naming and Directory Interface API			(18 perio	ods))
UNIT - I V SOAP Universal Description, Discovery Electronic Business XML			(20 perio	ds)	

Java API for XML Registries (JAXR) Web Services Description Language (WSDL)

Books:

Jim Keogh "The complete Reference J2EE" Tata McGraw Hill.

References:

- 1. Subrahmanyam Allamaraju et.all "Professional Java Server Programming" SPD /a! Press.
- 2. Stephanie Bodoff, Eric Armstrong, Jennifer Ball, Debbie Bode Carson, Lan Evans, Dale Green, Kim Haase, Eric Jendrock, "The J2EE Tutorial" Pearson Education.
- 3. Dreamtech Software Team "Java Server Programming" Dreamtech Press.
- 4. James McGovern, et.all "J2EE Bible".
- 5. BV Kumar, S Sangeetha, SV Subrahmanya "J2EE Architecture" Tata McGraw Hill.

CS/IT 415(A)

OPEN SOURCE SYSTEM

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

Unit I

(20 periods)

An over view of Red Hat Linux Installing Red Hat Linux Setting up Apache Web Server Setting up a MySQL Database server Configuring PHP To Use MYSQL

Getting Started with PHP - Scripts, Types in PHP, Useful Functions.

The PHP Language - Data Types, Type Conversions, Variables and Constants, Expressions and Operators, Control Structures.

Code Organization and Reuse - Basic Code Reuse: Functions, Intermediate Code Reuse: Using and Including Files.

Object-Oriented Programming - Extending Objects, Other Features.

Working with Arrays - Arrays Revisited, Iterating Over Elements in an Array, Multi-Dimensional Arrays, Operations on Arrays.

Strings and Characters of the World - Strings and PHP, Character Sets and Unicode, Making Sense of It All in PHP, Configuring PHP for Unicode, Operating on Strings.

Interacting with the Server: Forms - Working with HTML Forms, Working with Server, Redirecting the User.

Unit II

(18 periods)

Introduction to Databases - Basics, Motivations for Using a DBMS, Major Database Servers - How to Select a Database Server.

PHP and Data Access - Connecting and Authenticating, Executing Queries, Queries a Go-Go, Old-School Interfaces.

Web Applications and the Internet - A closer look at the WWW, Designing Web Applications

Implementing a User Interface - Considerations, Implementing your User Interface.

User Management - How users Connect to our Application, Visitors Versus Known Users, Validating Users.

Securing Your Web Applications: Planning and Code Security - Strategies for Dealing with Security, Identifying the Threats, Securing your Code.

Securing Your Web Applications: Software and Hardware Security - Securing Your Web Server and PHP, SSL, Database Security, Protecting the Network, Computer and Operating System Security.

Unit III

(17 periods)

Error Handling and Debugging - How Errors Are Born, How PHP Manages Errors, Exceptions, Debugging.

Cookies and Sessions - Tasty and Useful, Sessions, Session Security.

User Authentication - Planning for Members: Web Server-Provided Authentication. Advanced Output and Output Buffering - Globalization and Locales, Formatted Output, Output Buffering. Data Validation with Regular Expressions - Using Regular Expressions, Data Validation with Regular Expressions, Other Regular Expression Functions.

Unit IV

(15 periods)

Files and Directories - Accessing Files, Accessing Directories, Security Considerations.

File Uploading - Uploading User Files, A File-Uploading Example, Security Considerations.

Working with Dates and Times - Sources of Dates and Times, Dates and Times in PHP, More Dates and Times in Database Servers.

Using PEAR - Introduction, Installation and Configuration, Basic Commands, Example: Using the Date Class.

Development and Deployment - Coding Standards, Source Code Control, Testing, Deployment.

Strategies for Successful Web Applications: Singleton Objects - Session Management - A Holistic Approach to Error Handling, Database Connection Management, PHP Configuration Settings.

TEXT BOOKS :

- 1. Red Hat Linux Bible by Christoopher Negus Wiley Dreamtech
- 2. Core Web Applications Development with PHP and MySQL by Marc Wandschneider

REFERENCES:

- 1. Beginning PHP5, Apache, MySQL Web Development by Elizabeth Naramore, Jason Gerner, Yann Le Scouarnec, Jermy Stolz, Michael K. Glass, Wiley Dreamtech (Wrox) 2006.
- 2. PHP5 and MySQL Bible by Tim Converse, Joyce Park, Clark Morgan Wiley India 2004.

CS/IT 415(B)

INTERACTIVE COMPUTER GRAPHICS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks		70

UNIT I :

(20 Periods)

Introduction : Basic concepts, Application areas of Computer Graphics, overview of graphics systems - video-display devices, raster-scan systems, random scan systems, graphics monitors and work stations, input devices and their logical classifications, Hard copy devices and Graphics software.

Output primitives: Points and lines, line drawing algorithms - DDA, Bresenham's, midpoint circle and ellipse algorithms, Filled area primitives - Scan line polygon fill algorithm, inside-outside tests, boundary-fill and flood-fill algorithms, character generation and Antialiasing.

UNIT II :

(15 Periods)

2-D geometrical transforms: Translation, scaling, rotation, reflection and shear transformations, matrix representations and homogeneous coordinates, composite transforms, transformations between coordinate systems.

2-D viewing: The viewing pipeline, viewing coordinate reference frame, window to viewport coordinate transformation, viewing functions, Cohen-Sutherland and Liang-Barsky line clipping algorithms, Sutherland -Hodgeman polygon clipping algorithm.

UNIT III:

(15 Periods)

Three Dimensional Concepts: 3-D Display method, 3-D object representation: Polygon surfaces, Curved lines and surfaces, quadric surfaces, spline representation, Bezier curve and surfaces.

3-D Geometric transformations : Translation, rotation, scaling, reflection and shear transformations, composite transformations.

UNIT IV:

(15 Periods)

3-D viewing : Viewing pipeline, viewing coordinates, projections, view volume and general projection transforms and clipping.

Computer animation: Design of animation sequence, general computer animation functions, raster animation, computer animation languages, key frame systems, motion specifications.

TEXT BOOKS :

1. "Computer Graphics *C version*", Donald Hearn and M.Pauline Baker, Pearson Education.

REFERENCES:

- 1. "Computer Graphics Principles & practice", second edition in C, Foley, VanDam, Feiner and Hughes, Pearson Education.
- 2. Computer Graphics, Steven Harrington, TMH
- 3. "Computer Graphics Second edition", Zhigand xiang, Roy Plastock, Schaum's outlines, Tata Mc- Graw hill edition.
- 4. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
- 5. "Principles of Interactive Computer Graphics", Neuman and Sproul, TMH.
- 6. Principles of Computer Graphics, Shalini Govil, Pai, 2005, Springer.

CS/IT 415 (C)

.NET TECHNOLOGIES

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks		70

Unit I

Introduction to C# 2.0 Expressions and control structures Strings and regular expressions Arrays and collections Object-oriented programming in C# Introduction to generics I/O and persistence Working with XML Events and delegates Multithreaded programming Reflection fundamentals

Unit II

Assemblies and AppDomains COM and windows interoperability Code access security Cryptography and data protection Optimizing your .NET 2.0 code ADO.NET fundamentals Advanced ADO.NET techniques Working with ADO.NET data providers Strongly typed DataSets Programming with SQL Server 2005

Unit III

Introduction to ASP.NET 2.0 and Web forms State management in ASP-NET 2.0 Using master pages ASP.NET personalization and customization Introduction to Web parts Building rich, data-driven Web applications Securing your ASP.NET applications Creating custom ASP.NET providers Development ASP.NET controls ASP.NET management and monitoring Exposing functionality with Web services Advanced Web services programming

Unit IV

Introduction to Windows Forms 2.0 The Windows Forms control library Advanced user interface programming Data binding with Windows Forms 2.0 Developing smart clients Deploying applications using ClickOnce Using Enterprise services Remoting

Text Book:

1. Microsoft Visual C# 2005 Unleashed by **Kevin Hoffman**, Sams (Pearson India), 2006. Reference Books

- 1. Core C# and .NET by Stephen C.Pary, Prentice Hall (Pearson Education), 2006.
- 2. C#: The complete reference by Herbert Schildt, Tata McGraw Hill, 2006 2/e.
- 3. Pro C# 2005 and the .NET Platform by Andrew Troelson, Apless 2005 3/e

CS/IT 415 (D)

DIGITAL SIGNAL PROCESSING

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT 1

Introduction:

Signals, Systems, and Signal Processing, Classification of Signals, The Concept of Frequency in Continuous-Time and Discrete-Time Signals, Analog-to-Digital and Digital-to-Analog Conversion.

Discrete-Time Signals And Systems:

Discrete-Time Signals, Discrete-Time Systems, Analysis of Discrete-Time Linear Time-Invariant systems, Discrete-Time Systems Described by Difference Equations, Implementation of Discrete-Time Systems2.6 Correlation of Discrete-Time Signals.

The Z-Transform And Its Application To The Analysis Of Lti Systems:

The z-transform, Properties of the z-Transform, Rational z-Transforms, Inversion of the z-Transform, Analysis of Linear Time Invariant Systems in the z-Domain, The One-sided z-Transform

UNIT 2

(18 Periods)

(20 Periods)

Frequency Analysis Of Signals And Systems:

Frequency Analysis of Continuous-Time Signals, Frequency Analysis of Discrete-Time Signals, Frequency-Domain and Time-Domain Signal Properties, Properties of the Fourier Transform for Discrete-Time Signals.

Sampling And Reconstruction Of Signals:

Ideal Sampling and Reconstruction of Continuous-Time Signals, Discrete-Time Processing of Continuous-Time Signals, Analog-to-Digital and Digital-to-Analog Converters, Sampling and Reconstruction of Continuous-Time Bandpass Signals, Sampling of Discrete-Time Signals, Oversampling A/D and D/A Converters.

The Discrete Fourier Transform: Its Properties And Applications:

Frequency Domain Sampling: The Discrete Fourier Transform, Properties of the DFT, Linear Filtering Methods Based on the DFT, Frequency Analysis of Signals Using the DFT, The Discrete Cosine Transform.

UNIT 3

(17 Periods)

Efficient Computaiton Of The Dft: Fast Fourier Transform Algorithms:

Efficient Computation of the DFT: FFT Algorithms, Applications of FFT Algorithms, A Linear Filtering Approach to Computation of the DFT, Quantization Effects in the Computation of the DFT.

Multirate Digital Signal Processing

Introduction, Decimation by a Factor D, Interpolation by a Factor I, Sampling Rate Conversion by a Rational Factor I/D, Implementation of Sampling Rate Conversion, Multistage Implementation of Sampling Rate Conversion, Sampling Rate Conversion of Bandpass Signals, Sampling Rate conversion by an Arbitrary Factor, Applications of Sampling Rate Conversion, Digital Filter Banks, Two-Channel Quadrature Mirror Filter Bank, M-Channel QMF Bank.

UNIT 4

Linear Prediction And Optimum Linear Filters:

Random Signals, Correlation Functions and Power Spectra, Innovations Representation of Stationary Random Process, Forward and Backward Linear Prediction, Solution of the Normal Equations, Properties of the Linear Prediction-Error Filters, AR Lattice and ARMA Lattice-Ladder Filters, Wiener Filters for Filtering and Prediction

Adaptive Filters

Applications of Adaptive Filters, Adaptive Direct-Form FIR Filters-The LMS Algorithm, Adaptive Direct-Form FIR Filters-RLS Algorithms, Adaptive Lattice-Ladder Filters

Power Spectrum Estimation

Estimation of Spectra from Finite-Duration Observations of Signals, Nonparametric Methods for Power Spectrum Estimation, Parametric Methods for Power Spectrum Estimation, Filter Bank Methods, Eigenanalysis Algorithms for Spectrum Estimation.

Text book:

Digital Signal Processing by John Proakis, Dimitris Manolakis 4th Edition (Pearson) (ISBN13: 9780131873742, ISBN10: 0131873741)

References:

Oppenheim & Ronald W Schafer," Digital Signal Processing", Prentice Hall India

CS/IT 415(E)

MULTIMEDIA SYSTEMS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	 30
University Exam	:	3 hours	University Examination Marks	 70

UNIT I

(15 Periods)

Multimedia Authoring and data representations: Introduction to multimedia and hypermedia, WWW, overview of multimedia software tools.

Multimedia Authoring and Tools: Multimedia authoring some useful editing and authoring tools, VRML.

Graphics and Image data representation: Graphics/Image data types , popular file formats.

Color in image and Video: Color models in images, Color models in Video.

Fundamental concepts in video: types of video signals, analog video, digital video.

UNIT II

(20 Periods)

Basics of Digital Audio: Digitization of sound, MIDI, Quantization and transmission of audio **Lossless compression algorithms:** Run-length coding, Variable length coding, Dictionary based coding, Arithmetic coding, loss less image compression.

Lossy Compression Algorithms: Quantization, Transform coding, Wavelet based coding.

UNIT III

(18 Periods)

Image compression Standards: JPEG standard, JPEG 2000 standard, Bi-level image compression standards

Basic Video Compression Techniques: Introduction to video compression, Video compression based on motion compensation. Search for motion vectors, H.261, H.263 **MPEG Video Coding:** MPEG - 1 and MPEG - 2

UNIT IV

(17 Periods)

Multimedia Network Communications and applications: Quality of Multimedia data transmission, multimedia over IP, Multimedia over ATM networks Content Based retrieval in Digital Libraries: Current Image search systems, C-BIRD, multimedia databases

TEXT BOOKS:

Fundamentals of multimedia, Ze-Nian Li, Mark S. Drew, Pearson education 2007.

REFERENCES:

- 1. Multimedia Applications, Steinmetz, Naharstedt, Springer
- 2. Multimedia Communications, Applications, Networks, Protocols and Standards Fred Halsall, pearson education.
- 3. Multimedia systems design, Prabhat K. Andeliegh, Kiran Thakrar, PHI,2007.
- 4. Multimedia producers Bible, Ron Goldberg, comdex computer publishing.

CS/IT 415 (F)

SOFTWARE TESTING METHODOLOGIES

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I :

(18 Periods)

Principles of Testing; Software Development Life Cycle Models - Phases of Software Project - Quality, Quality Assurance and Quality Control - Testing, Verification and Validation - Process Model to Represent Different Phases

White Box Testing: Static Testing - Structural Testing - Challenges

Black Box Testing: What, Why, When, How.

UNIT II :

(18 Periods)

Integration Testing: Integration Testing as a Type of Testing - Integration Testing as a Phase of Testing - Scenario Testing - Defect Bash.

System and Acceptance Testing: Overview - Functional Versus Non-Functional - Functional System Testing & Non-Functional - Acceptance Testing.

Performance Testing: Introduction - Factors, Methodology, Tools & Process.

Regression Testing: Introduction -Types - When to do Regression Testing - How to do Regression Testing - Best Practices in Regression Testing.

UNIT III:

(17 Periods)

Ad hoc Testing: Overview - Buddy Testing - Pair Testing - Exploratory Testing - Iterative - Agile and Extreme Testing - Defect Seeding.

Usability and Accessibility Testing: Approach to Usability - When to do Usability - How to achieve Usability - Quality Factors for Usability - Aesthetics Testing - Accessibility Testing - Tools for Usability - Usability Lab Setup - Test Roles for Usability.

Common People Issues: Perceptions and Misconceptions About Testing - Comparison between Testing and Development Functions - Providing Career Paths for Testing Professionals - Role of the Ecosystem and a Call for Action.

Organization Structures for Testing Teams: Dimensions of Organization Structures -Structures in Single-Product Companies, Multi-product Companies - Effects of Globalization and Geographically Distributed Teams on Product Testing - Testing Services Organizations - Success Factors for Testing Organizations.

UNIT IV:

(20 Periods)

Test Planning, Management, Execution and Reporting: Introduction - Planning - Management - Process - Reporting - Best Practices.

Software Test Automation: Terms used in Automation - Skills needed for Automation -What to Automate, Scope of Automation - Design and Architecture for Automation -Generic Requirements for Test Tools - Process Model for Automation - Selecting a Test Tool - Automation for Extreme Programming Model - Challenges.

Test Metrics and Measurements: Metrics & Measurements - Types - Project - Progress - Productivity - Release.

TEXT BOOKS :

1. Srinivasa Desikan & Gopalaswamy Ramesh, "Software Testing - Principles and Practices", Pearson Education, 2007.

REFERENCES:

- 1. Software Testing techniques Baris Beizer, Dreamtech, second edition.
- 2. The craft of software testing Brian Marick, Pearson Education.
- 3. Software Testing Techniques SPD(Oreille)
- 4. Software Testing Effective Methods, Tools and Techniques Renu Rajani, Pradeep Oak, TMK.
- 5. Effective methods of Software Testing, Perry, John Wiley.

CS/IT 416(A)

TOTAL QUALITY MANAGEMENT

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT-I

(15 Periods)

INTRODUCTION: Definition of Quality, Dimensions of Quality, Quality Planning, Quality costs - Analysis Techniques for Quality Costs, Basic concepts of Total Quality Management, Historical Review, Principles of TQM, Leadership - Concepts, Role of Senior Management, Quality Council, Quality Statements, Strategic Planning, Deming Philosophy, Barriers to TQM Implementation.

Unit-II

(20 Periods)

TQM PRINCIPLES: Customer satisfaction - Customer Perception of Quality, Customer Complaints, Service Quality, Customer Retention, Employee Involvement - Motivation, Empowerment, Teams, Recognition and Reward, Performance Appraisal, Benefits, Continuous Process Improvement - Juran Trilogy, PDCA Cycle, 5S, Kaizen, Supplier Partnership - Partnering, sourcing, Supplier Selection, Supplier Rating, Relationship Development, Performance Measures - Basic Concepts, Strategy, Performance Measure.

UNIT-III

(15 Periods)

STATISTICAL PROCESS CONTROL (SPC): The seven tools of quality, Statistical Fundamentals - Measures of central Tendency and Dispersion, Population and Sample, Normal Curve, Control Charts for variables and attributes, Process capability, Concept of six sigma, New seven Management tools.

TQM TOOLS: Benchmarking - Reasons to Benchmark, Benchmarking Process, Quality Function Deployment (QFD) - House of Quality, QFD Process, and Benefits.

UNIT-IV

(15 Periods)

TQM TOOLS : Taguchi Quality Loss Function, Total Productive Maintenance (TPM) - Concept, Improvement Needs, FMEA - Stages of FMEA.

QUALITY SYSTEMS: Need for ISO 9000 and Other Quality Systems, ISO 9001:2000 Quality System - Elements, Implementation of Quality System, Documentation, Quality Auditing, QS 9000, ISO 14001 - Concept, Requirements and Benefits.

TEXT BOOK

Dale H. Besterfield, "Total Quality Management", Pearson Education, Indian reprint 2004.

REFERENCES

- 1. James R. Evans & William M. Lidsay, "The Management and Control of Quality" 5th Edition, South-Western (Thomson Learning), 2002
- 2. Feigenbaum. A. V. "Total Quality Management", McGraw-Hill, 1991.

BUSINESS PROCESS MODELS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT-I

Introduction, Reasons for Outsourcing, Issues in Outsourcing, Perquisites of Outsourcing, Outsourcing Delivery Models.

UNIT-II

Alternative Strategies, Failures in outsourcing, Relationship Management, Selection of Vendors.

Contracts and Contractual Issues, Intellectual Property, Locations and Offshore Destinations, Evolution and Future of Outsourcing Industry. Case Study: Software

UNIT-III

(20 periods)

(15 periods)

UNIT-IV

Professionals overseas

Offshore Outsourcing: The Next Wave, Offshore Outsourcing Business Models, the Business Process Offshoring Landscape, IT Offshore Outsourcing, Transaction Processing Outsourcing.

Text Books:

- 1. Robin Sood, "IT, Software and Services: Outsourcing and Offshoring' AiAiYo Books, LLC.
- 2. Robinson, Marcia and Ravi Kalakota. (2004) "Offshore Outsourcing: Business Models, ROI and Best Practices." Mivar Pr Inc; 2nd edition.

Reference Book:

1. Robert B. Walford. "Business Process Implementation for IT Professionals and Managers" ARTECH House Inc, 1999.

(15 periods)

(20 periods)

IT 416(B)

⁹⁷ A.N.U B.Tech (IT) w.e.f. 2007-08

CS/IT 416(C)

EMBEDDED SYSTEMS

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	•••	3 hours	University Examination Marks	•••	70

UNIT - I

A First Look at the Embedded Systems: Examples of Embedded Systems (Telegraph, cordless Bar-code scanner, Laser Printer, underground tank monitor, Nuclear Reactor Monitor), Typical Hardware.

Hardware Fundamentals: Terminology, Gates, A few other basic considerations, Timing Diagrams, Memory.

Advanced Hardware Fundamentals: Micro Processors, Buses, Direct Memory Access, interrupts, other common parts, Built-ins on the Micro Processor, conventions used on the Schematics.

Interrupts: Micro Processor Architecture, Interrupt Basics, the shared data problem, Interrupt Latency.

UNIT - II

(15 Periods)

Survey of Software Architectures: ROUND-ROBIN, ROUND-ROBIN with Interrupts, Function-Queue-Scheduling Architecture, Real Time Operating System Architecture, Selecting an Architecture.

Introduction to Real Time Operating Systems: Tasks and Task states, Tasks and data Semaphores and shared data.

More Operating System Services: Message Queues, Mail boxes and pipes, Timer Functions,

Basic Design Using a Real Time Operating System: Overview, Principles, An Example, Encapsulating Semaphores and Queues, Hard Real Time Considerations, Saving Memory

UNIT - III

UNIT - IV

(20 Periods)

(15 Periods)

Embedded Software Development Tools: Host and Target Machines, Linker/Locators for Embedded Software, Getting Embedded Software into the target System.

Debugging Techniques: Testing on Host Machine, Instruction Set Simulators, the *assert* macro, using Laboratory Tools.

Textbooks:

David E.Simon, 'An Embedded Software Primer', Pearson Education Asia.

Events, Memory Management, Interrupt Routines in an RTOS environment.

Reference Books:

Space, Saving Power.

- 1. D.Gajski, F.Vahid, S.Narayan, J.Gong, 'Specification and Design of Embedded Systems', Prentice Hall of India Pvt. Ltd.,
- 2. Raj Kamal, 'Embedded Systems Architecture & Programming', Tata McGraw-Hill.

(15 Periods)

CSE / IT 416(D)

Lectures	:	4 periods/week	Sessional Marks	30
University Exam	:	3 hours	University Examination Marks	70

BIOINFORMATICS

UNIT - I

1. Introduction

Definitions, Sequencing, Molecular Biology and Bioinformatics, Biological sequence/structure, Genomoe Projects, Pattern Recognition and prediction, Folding problem, Sequence Analysis, Homology and Analogy, Bioinformatics Applications, Central Dogma of Molecular Biology

2. Information Resources

Biological databases, Primary Sequence databases, Protein sequence databases, Secondary databases, Protein pattern databases, and Structure classification databases DNA sequence databases, specialized genomic resources

UNIT - II

3. DNA Sequence Analysis

Importance of DNA analysis, Gene Structure and DNA sequences, Features of DNA sequence analysis, EST (Expressed Sequence Tag) searches, Gene Hunting, Profile of a cell, EST analysis, Effects of EST data on DNA databases, The Human Genome Project

4. Pair Wise Alignment Techniques

Database Searching, Alphabets and complexity, algorithm and programs, comparing two sequences, sub-sequences, Identity and similarity, The Dot plot, Local and Global similarity, Different alignment techniques, Scoring Matrices, Dynamic Programming, Pair wise database searching

UNIT - III

5. Multiple sequence alignment & Phylogenetic Analysis

Definition and goal, The consensus, Computational complexity, Manual methods, Simultaneous methods, Progressive methods, Databases of Multiple alignments, and searching, Applications of Multiple Sequence alignment, Phylogenetic Analysis, Methods of Phylogenetic Analysis, Tree Evaluation, Problems in Phylogenetic analysis, Tools for Phylogenetic Analysis

6. Secondary database Searching

Importance and need of secondary database searches, secondary database structure and building a sequence search protocol

UNIT - IV

7. Gene Expression and Microarrays Introduction, DNA Microarrays, Clus

Introduction, DNA Microarrays, Clustering Gene Expression Profiles, Data Sources and tools, Applications

8. Analysis Packages Analysis Package structure, commercial databases, commercial software, comprehensive packages, packages specializing in DNA analysis, Intranet Packages, Internet Packages.

Text Book:

1. Introduction to Bioinformatics T K Attwood And D.J. Parry-Smith, Pearson

2. Bioinformatics methods and applications S.C. Rastogi, N. Mendiratta And P. Rastogi., PHI

Reference Books:

- 1. Introduction to Bioinformatics Arthur M. Lesk OXFORD Publishers (Indian Edition)
- 2. Elementary Bioinformatics, Imtiyaz Alam Khan, Pharma Book Syndicate

⁹⁸ A.N.U B.Tech (IT) w.e.f. 2007-08

(15 Periods)

(15 Periods)

(12 Periods)

(18 Periods)

CS/IT 416 (E)

VLSI DESIGN

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT- I

(15 Periods)

An introduction to MOS technology: Introduction to IC technology, Basic MOS transistors, NMOS fabrication, CMOS fabrication and BICMOS technology. Basic Electrical Properties Of MOS and BICMOS Circuits: Ids versus Vds relationships, threshold voltage Vt, Transconductance gm, Figure of merit ω_0 , Pass transistor, NMOS inverter, Pull-up to pull-down ratio, CMOS inverter, BICMOS inverters, Latch-up in CMOS circuits.

UNIT- II

(18 Periods)

MOS and BICMOS circuit Design processes: MOS layers, Stick diagrams, Design rules and layout, Sheet resistance Rs, Standard unit of capacitance, The Delay unit, Inverter delays, Propagation delays, Wiring capacitances, Scaling models, Scaling factors for device parameters.

UNIT- III

(15 Periods)

Subsystem design and layout: Architectural issues, Switch logic, Gate Logic, examples of Structured Design (combinational logic). Design of an ALU subsystem, A further consideration of adders, Multipliers.

UNIT- IV

(17 Periods)

VLSI design flow, Introduction to ASICs, Full Custom ASICs, standard cell based ASICs, Gate array based ASICs, Programmable logic devices, PLAs, PALs, CPLDs and FPGAs, Hardware description languages.

The VHDL Hardware Description Language: Design Flow, Program Structure, Types and Constants, functions and Procedures, Libraries and Packages, Structural Design Elements, Dataflow design Elements, Behavioral design Elements, The Time Dimension and Simulation, Synthesis.

TEXT BOOKS:

- 1. Douglas A.Pucknell and Kamran Eshranghian, Basic VLSI Design, Third edition, PHI 2002.
- 2. Michael John Sebastian Smith, Application Specific Integrated Circuits, Addison Wesley, 2003.
- 3. J.Bhasker, A VHDL Primer, Pearson Education, Third edition, 1999.
- 4. John F Wakerly, Digital Design Principles & Practices, 3rd Edition, Pearson Education, 2002.

REFERENCE BOOKS:

- 1. Neil H E Weste and Kamran Eshranghian, Principles of CMOS VLSI Design, A system perspective, 2nd edition, Pearson Education, 2002.
- 2. Stephen Brown and Z Vonko Vranesic, Fundamentals of Digital Logic with VHDL Design, TMH Edition, 2002.

CS/IT 416(F)

Lectures 4 periods/week Sessional Marks 30 : University Exam 3 hours University Examination Marks 70 : :

QUANTUM COMPUTING

UNIT- I

Introduction - From Bits to Qubits - Power of Quantum Computing - How Quantum Physics Differs from - Obstacles and Research - Future Outlook. Qubits, Quantum Mechanics and Computer Science Perspectives

UNIT- II

Quantum Gates - Single & Multiple Qubit Gates - Matrix Representation of Quantum Gates and Circuits - Bell States - Quantum Measurement - Quantum Half-Adder and Subtractor.

Applications of Quantum Computing - Quantum Teleportion - Parallelism -Superdense Coding - Quantum Communication.

UNIT- III

Shor's Algorithm and Quantum Fourier Transform

Grover's Algorithm (Quantum Search Algorithms)

UNIT- IV:

Physical Realization of Quantum Computers

Quantum Computing Software

Text book:

Vishal Sahni. "Quantum Computing", TMH, 2007. 1.

Reference books:

- Dan C. Marinescu, Gabriela M. Marinescu, "Approaching Quantum 1. Computing" Prentice Hall, 2004.
- Mika Hirvensalo "Quantum Computing", 2nd Edition, Springer, 2004 2.
- 3. Giuliano Beneti, Giulio Casati, Guiliano Strini "Principles of Quantum Computation and Information" Vol.1 Basic Concepts, World Scientific Publishing Company; New Ed edition (October 2004)

(15 periods)

(15 periods)

(15 periods)

(15 periods)

CS/IT 451 SOFTWARE ENGINEERNG LAB / MINI PROJECT

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	:	50

CYCLE - 1

1. Problem Statement

ANALYSIS

- 2. Requirements elicitation
- 3. System Requirements Specification
 USECASE VIEW
- 4. Identification of Actors
- 5. Identification of Use cases
- 6. Flow of Events
- 7. Construction of Use case diagram
- 8. Building a Business Process model using UML activity diagram

<u>CYCLE - 2</u>

LOGICAL VIEW

- 9. Identification of Analysis Classes
- 10. Identification of Responsibilities of each class
- 11. Construction of Use case realization diagram
- 12. Construction of Sequence diagram
- 13. Construction of Collaboration diagram
- 14. Identification of attributes of each class
- 15. Identification of relationships of classes
- 16. Analyzing the object behavior by constructing the UML State Chart diagram
- 17. Construction of UML static class diagram

<u>CYCLE - 3</u>

DESIGN

- 18. Design the class by applying design axioms and corollaries
- 19. Refine attributes, methods and relationships among classes

MINI PROJECT

The above three cycles are to be carried out in the context of a problem / system choosen by the Project batch and a report is to be submitted at the semester end by the batch.

CS/IT 452 ENTERPRISE PROGRAMMING LAB

Lectures	:	3 periods/week	Sessional Marks		25
University Exam	•••	3 hours	University Examination Marks	:	50

- 1. Write a program to demonstrate Generic & HTTP Servlets.
- 2. Write a program to demonstrate cookie & Sessions.
- 3. Write an application to integrate JSP & Servlets.
- 4. Write a program to demonstrate Session Bean.
- 5. Write a program to demonstrate Entity Bean.
- 6. Write a program to demonstrate Java Mail.
- 7. Write a program to demonstrate Remote Method Invocation.
- 8. Write a program to demonstrate Java Message service.
- 9. Write a program to demonstrate JNDI.
- 10. Develop an e-business application using XML.
- 11. Develop an application for Client Request / Responses using SOAP.
- 12. Demonstrate how to describe web services using WSDL.

CS/IT 453(A) (ELECTIVE-II)

OPEN SOURCE SYSTEM LAB

Lectures	 3 periods/week	Sessional Marks	 25
University Exam	3 hours	University Examination Marks	50

- 1. Demonstrate the configuration of Apache, MySQL and PHP.
- 2. Write PHP Script to demonstrate String processing and regular Expressions in PHP.
- 3. Program to demonstrate Object Oriented features of PHP.
- 4. Write Script that takes user input data and validates it and write the data into the database.
- 5. Program to demonstrate DML commands in MySQL.
- 6. Program to demonstrate exception handling in PHP.
- 7. Program to demonstrate Passing of Information between Web pages.
- 8. Program to demonstrate the use of Cookies.
- 9. Program to demonstrate user management and authentication.
- 10. Program to demonstrate file Uploading.
- 11. Program to demonstrate source code control and Testing.

CS/IT 453(B) (ELECTIVE-II) INTERACTIVE COMPUTER GRAPHICS LAB

Lectures		3 periods/week	Sessional Marks	:	25
University Exam	•••	3 hours	University Examination Marks	•••	50

1. Write a program to implement the following line drawing algorithm

a. DDA b. Bresenham's

- 2. Write a program to implement the mid-point circle algorithm.
- 3. Write a program to implement the mid-point ellipse algorithm.
- 4. Write a program to check whether the given point is inside or outside of a polygon using even-odd and winding number methods.
- 5. Write a program to implement the scan-line polygon filling algorithm
- 6. Write a menu driven program to implement the following 2D Transformationsa. Scaleb. Rotationc. Translation
- Write a menu driven program to implement the following 2D Transformations

 a. Shear
 b. Reflection
- 8. Write a program to implement the following line clipping algorithmsa. Cohen-Sutherlandb. Liang-Barsky
- 9. Write a program to implement the Sutherland-Hodgman polygon clipping algorithms.
- 10. Write a menu driven program to implement the following 3D Transformations
 - a. Scale b. Rotation c. Translation
- 11. Write a menu driven program to implement the following projections
 - a. Parallel b. Perspective
- 12. Write a program to implement a simple animation.

CS/IT 453(C) (ELECTIVE-II) .NET TECHNOLOGIES LAB

Lectures	:	3 periods/week	Sessional Marks	 25
University Exam	:	3 hours	University Examination Marks	50

- 1. Write a program to demonstrate OOPs concepts in C#.
- 2. Write a program to demonstrate Exception handling in C#.
- 3. Write a program to illustrate the concepts of events & delegates in C#.
- 4. Write a program to demonstrate multi-threaded programming in C#.
- 5. Write a program to demonstrate generics.
- 6. Write a program to demonstrate StreamWriters and StreamReaders.
- 7. Write a program to demonstrate Building and consuming a multi file assembly.
- 8. Write a program to demonstrate DML and DDL Commands using ADO.NET.
- 9. Write a program to build a data driven ASP.NET Web application.
- 10. Write a program to demonstrate ASP.NET controls.
- 11. Write a program to demonstrate Windows Forms Controls.
- 12. Write a program to demonstrate the building of a simple Windows Forms Application.

CS/IT 453(D) (ELECTIVE-II) DIGITAL SIGNAL PROCESSING LAB

Lectures		3 periods/week	Sessional Marks		25
University Exam	•••	3 hours	University Examination Marks	•••	50

- 1. Implementation of Linear Convolution
- 2. Implementation of Circular Convolution
- 3. Implementation of DFT using direct formula
- 4. Implementation of IDFT using direct formula
- 5. Implementation of DFT and IDFT using DIT FFT algorithm
- 6. Implementation of DFT and IDFT using DIF FFT algorithm
- 7. Design of Butterworth Filter using Bilinear Transformation
- 8. Design of Chebyshev filter using Bilinear Transformation
- 9. Design of FIR filter using Rectangular window
- 10. Design of FIR filter using Hamming window

CS/IT 453(E) (ELECTIVE-II) MULTIMEDIA SYSTEMS LABORATORY USING FLASH/MAX2007/DAZZLER SPARKLES

Lectures	:	3 periods/week	Sessional Marks		25
University Exam	:	3 hours	University Examination Marks	•••	50

Software Programs:

- 1. A tour of motion
- 2. Generators and particle presets
- 3. Groups layers and blend modes
- 4. The third dimension
- 5. Using templates
- 6. Creating text effects
- 7. Particles and parameter behaviors
- 8. The replicator
- 9. Advanced particle design
- 10. Keyframing
- 11. Painting in motion
- 12. Plugging multimedia hardware

Hardware Plugins:

- 13. Optical storage devices
- 14. DVD
- 15. Touch screens
- 16. Magnetic card encoders & readers
- 17. Graphics tablets
- 18. OCR's
- 19. Infrared remotes
- 20. Voice recognition systems
- 21. Digital Cameras
- 22. Amplifiers and speakers
- 23. Video devices
- 24. Projectors
- 25. Printers
- 26. Modems
- 27. ISDN
- 28. Cable modems

TEXT BOOKS & WEB REFERENCES:

- 1. Vaughan, T. "Multimedia Making it work (5th edition) ", McGraw-Hill.
- 2. Boyle, T. "Design for Multimedia Learning", Prentice-Hall, 1997.

CS/IT 453(F) (ELECTIVE-II) SOFTWARE TESTING METHODOLOGIES LAB

Lectures	:	3 periods/week	Sessional Marks	:	25
University Exam	:	3 hours	University Examination Marks		50

WinRunner:

Create the following tests using any GUI application:

- 1. GUI Map Editor
- 2. Merging GUI file
- 3. Rapid test script wizard
- 4. Recording using context sensitive and analog modes
- 5. GUI Check points
- 6. Bitmap Check points
- 7. Database Check Points
- 8. Synchronization Points
- 9. Parameterized Check Points
- 10. Break points and Monitor
- 11. Data Driven
- 12. Web Page Test

TestDirector:

- 1. Creating a New Project
- 2. Create Test Plan
- 3. Execute Test Plan
- 4. Track Defects

LoadRunner:

Create the following Test

- 1. Virtual User Generator
- 2. Virtual User / V-Scripts
- 3. Controller

Text Books:

- 1. Dr.K.V.K.K.Prasad, "Software Testing Tools", Dreamtech Press.
- 2. Nageswara Rao Pusuluri, "Software Testing Concepts and Tools", Dreamtech Press.

DISRIBUTED SYSTEMS

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT-I

(12 periods)

Introduction: Definition of a Distributed System, Goals, Hardware Concepts, Software Concepts. The Client-Server Model.

Communication: Remote Procedure Call- Basic RPC Operation, Parameter Passing, Extended RPC Models, Remote Object Invocation - Distributed Objects, Binding a Client to an Object, Static versus Dynamic Remote Method Invocations, Parameter Passing.

Message-Oriented Communication: Persistence and Synchronicity in Communication, Message Oriented Transient and Persistent Communication.

UNIT- II

Processes: - Threads, Clients, Servers, Code Migration

Naming: Naming Entities -Names, Identifiers and Addresses, Name Resolution, The Implementation of a Name Space. Locating Mobile Entities, Removing Unreferenced Entities

UNIT- III

Synchronization: Clock Synchronization. Logical Clocks, Election Algorithms, Mutual Exclusion.

Consistency and Replication: Introduction, Data- Centric Consistency Models, Client -Centric Consistency Models, Distribution Protocols, Consistency Protocols.

UNIT- IV:

(12 periods)

Fault tolerance: Introduction to Fault Tolerance, Process Resilence, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit, Recovery.

Distributed File Systems:-Sun Network File System, The Coda File System.

Text book:

Andrew S.Tanenbaum, Maarten Van Steen "Distributed Systems: Principles and 1. Paradigms", 2002, Pearson Education/PHI.

Reference books:

- 3rd 1. Coulouris, Dollimore, Kindberg, "Distributed Systems-Concepts and Design" edition, Pearson Education.
- Mukesh, Singhal & Niranjan G.Shivarathri, "Advanced Concepts in Operating 2. Systems", TMH.
- 3. Sinha, "Distributed Operating System - Concepts and Design", PHI.

IT 421

(18 periods)

(18 periods)

IT 422

STORAGE AREA NETWORKS

Lectures	:	4 periods/week. Tutorial: 1	Sessional Marks		:	30
University Exam	:	3 hours	University Examin	ation Marks	:	70
••••••••••••••••••••••••••••••••••••••	<u> </u>				<u> </u>	
Unit I				(20 perio	ds)	
Introduction.						
What Storage Ne	etw	orking Is and What It Can Mea	n to You.			
Benefits: What t	to E	Expect from SANs.				
Leading up to SA	۹Ns	: One View of Data Center Evo	olution.			
Killer Apps for S	AN	S.				
Unit II				(18 perio	ds)	
Storage Network	king	g Architecture.				
The Storage in S	Sto	rage Networking.				
The Network in	Sto	orage Networking.				
Unit III				(17 perio	ds)	
Basic Software f	or	Storage Networking.				
Advanced Softw	are	for Storage Networking.				
Enterprise Back	up	Software for Storage Area Net	works.			
Unit IV				(15 perio	ds)	
Adopting Storag	e١	letworking.				
Managing SANs.						
Speculations on	the	e Future of SAN.				
Storage Network	king	g Organizations.				

Text Book:

Storage Area Network Essentials : A Complete Guide to Understanding and Implementing SANs (Hardcover) by <u>Richard Barker</u>, <u>Paul Massiglia</u>r by Wiley 2001

Reference Books

- 1. Storage Networks Explained: Basics and Application of Fibre Channel SAN, NAS iSCSI and InfiniBand By <u>Ulf Troppens</u>, <u>Rainer Erkens</u>, <u>Wolfgang Müller</u> Wiley 2004
- 2. Using SANs and NAS by W. Curtis Preston, Mike Loukides

¹¹¹ A.N.U B.Tech (IT) w.e.f. 2007-08

DATA ENGINEERING

Lectures	:	4 periods/week, Tutorial: 1	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

Data Warehouse - Introduction, A Multi-dimensional data model, Data Warehouse Architecture, Data Warehouse Implementation.

Data Mining - Introduction, Data Mining, Kinds of Data, Data Mining Functionalities, Classification of Data Mining Systems, Major issues in Data Mining.

UNIT - II

Data Preprocessing - Data cleaning, Data Integration & Transformation, Data Reduction, Discretization & Concept Hierarchy Generation, Data Mining Primitives.

Mining Association roles in large databases - Association rule mining, mining singledimensional Boolean Association rules from Transactional Databases, Mining Multidimensional Association rules from relational databases & Data Warehouses.

UNIT - III

Cluster Analysis - Introduction, Types of data in Cluster analysis, A categorization of major clustering methods, partitioning methods, Hierarchical methods, Density-Based Methods: DBSCAN, Grid-based Method: STING; Model-based Clustering Method: Statistical approach, Outlier analysis.

UNIT - IV

Classification & Prediction - Introduction, Classification by Decision tree induction, Bayesian Classification, , Classification by Back propagation, Other Classification Methods, Prediction, Classifier accuracy.

Mining Complex Type of Data - Multidimensional Analysis and Descriptive Mining of Complex Data Objects, Mining Spatial Databases, Mining Multimedia Databases, Mining Text Databases, Mining the World Wide Web.

Textbooks:

Data Mining Concepts & Techniques - Jiawei Han Micheline Kamber - Morgan Kaufmann Publishers.

Reference Books:

- 1. Data Warehouse Toolkit Ralph Kinball John Wiley Publishers.
- 2. Data Mining (Introductory and Advanced Topics) Margaret H.Dunham Pearson Education.
- 3. Data Warehousing in the real world A Practical guide for Building decision support systems Sam Anahory, Dennis Murray Pearson Education.
- 4. Introduction to Data Mining with case studies G.K.Gupta, PHI Publications, 2006

(18 Periods)

(18 Periods)

(15 Periods)

(20 Periods)

CS/IT 423

CS/IT 424 INDUSTRIAL ENGINEERING & MANAGEMENT

Lectures	:	4 periods/week	Sessional Marks	•••	30
University Exam	:	3 hours	University Examination Marks		70

UNIT-I

(15 periods)

(17 periods)

(15 periods)

(18 periods)

GENERAL MANAGEMENT: Principles of Scientific Management; Brief Treatment of Managerial Functions.

FORMS OF BUSINESS ORGANISATION: Salient features of sole proprietorship, Partnership, Joint Stock Company - Private limited and public limited companies.

UNIT-II

FINANCIAL MANAGEMENT: Concept of interest, Compound interest, Equivalent cash flow diagram.

ECONOMIC EVALUATION OF ALTERNATIVES: The annual equivalent method, Present worth method, Future worth method.

DEPRECIATION: purpose, Types of Depreciation; Common methods of depreciation; The straight line method, Declining balance method, the sum of the years digits method.

UNIT-III

PERSONNEL MANAGEMENT: Functions of personal Management: Human Resources Planning, Recruitment, Selection, Placement, Training and Development, Career development and Performance Appraisal.

JOB ANALYSIS: Job Description and Job specification. Motivational Theories, Leadership Styles & Stress Management.

UNIT-IV

MATERIAL MANAGEMENT: Introduction

PURCHASING: objectives, source selection, vendor rating, procurement methods.

INVENTORY MANAGEMENT: Objectives, Economic Order Quantity, Economic Production Quantity and ABC Analysis.

MARKETING MANAGEMENT: Functions of Marketing, Product life cycle, Channels of distribution, Advertising & sales promotion, Market Research.

Textbooks:

- 1. K.K.Ahuja, 'Industrial Management' Vol. I & II,
- 2. E.Paul Degarmo, John R.Chanda, William G.Sullivan, 'Engineering Economy'.

Reference Books:

- 1. Philip Kotler, 'Principles of Marketing Management' PHI
- 2. Gopalkrishna, 'Materials Management' PHI
- 3. Koontz & Weirich, 'Management' TMH

CS/IT 425(A)

DIGITAL & IMAGE PROCESSING

Lectures	:	4 periods/week	Sessional Marks	 30
University Exam	:	3 hours	University Examination Marks	 70

Unit - I

(15 periods)

INTRODUCTION: Digital Image Processing, Fundamental Steps in Digital Image Processing, Components of an Image Processing System.

DIGITAL IMAGE FUNDAMENTALS: Elements of Visual Perception, Image Sensing and Acquisition, Image Sampling and Quantization, Some basic Relationships Between Pixels.

Unit - II

(20 periods)

IMAGE ENHANCEMENT IN THE SPATIAL DOMAIN: Some Basic Gray Level Transformation, Histogram Processing, Enhancement Using Arithmetic/Logic Operations, Basics of Spatial Filtering, Smoothing spatial Filters, Sharpening spatial Filters.

IMAGE ENHANCEMENT IN THE FREQUENCY DOMAIN: Introduction to the Fourier Transform and the Frequency Domain, Smoothing frequency-domain Filters, Sharpening frequency-domain Filters, Homomorphic Filtering, Implementation.

Unit - III

(15 periods)

IMAGE RESTORATION: A Model of the Image Degradation/Restoration Process, Linear, Position-Invariant Degradations, Inverse Filtering, Minimum Mean Square Error (Wiener) Filtering, Constrained Least Squares Filtering.

WAVELETS AND MULTIRESOLUTION PROCESSING: Multiresolution Expansions, Wavelet Transforms in one Dimension, The Fast Wavelet Transform, Wavelet Transforms in Two Dimensions.

Unit - IV

(20 periods)

IMAGE COMPRESSION: Image Compression Models, Error-free Compression, Lossy Compression, Image Compression Standards.

IMAGE SEGMENTATION: Detection of Discontinuities, Edge Linking and Boundary Detection, Thresholding, Region-Based Segmentation.

Text Book:

1. Rafael C. Gonzalez, Richard E. Woods, 'Digital Image Processing' Addison Wesley Pubs (Second Edition).

Reference Books:

- 1. Milan Sonka, Vaclav Hlavac, Roger Boyle Image Processing. Analysis, and Machine Vision (Second Edition).
- 2. A.K.Jain, 'Fundamentals of Digital Image Processing' PHI.
- 3. Philips, 'Image Processing in C', BPB Publications.

IT 425(B)

MOBILE COMPUTING

Lectures	:	4 periods/week	Sessional Marks		30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT-I

(12 periods)

Introduction: Mobility of Bits and Bytes - Wireless-The Beginning - Mobile Computing - Dialogue Control - Networks - Middleware and Gateways - Application and Services (Contents) - Developing Mobile Computing Application s- Security in Mobile Computing - Standards-Why is it Necessary? - Standard Bodies - Players in the Wireless Space.

Mobile Computing Architecture: Internet-The Ubiquitous Network - Architecture for Mobile Computing - Three-Tier Architecture - Design Considerations for Mobile Computing - Mobile Computing through Internet - Making Existing Applications Mobile-Enabled.

Mobile Computing Through Telephony: Evolution of Telephony - Multiple Access Procedures - Mobile Computing through Telephone - Developing an IVR Application - Voice XML - Telephony Applicatioin Programming Interface (TAPI).

Emerging Technologies: Introduction - Bluetooth - Radio Frequency Identification (RFID), WiMAX - Mobile IP - IPv6 - Java Card.

UNIT-II

(15 periods)

Global System for Mobile Communications (GSM): GSM Architecture - Entities - Call Routing in GSM - PLMN Interfaces - GSM Addresses and Identifiers - Network Aspects in GSM - GSM Frequency Allocation - Authentication and Security.

Short Message Service (SMS): Mobile Computing over SMS - SMS - Value Added Services through SMS - Accessing the SMS Bearer.

GPRS: Packet Data Network - Network Architecture - Network Operations - Data Services in GPRS - Applications for GPRS - Limitations - Billing and Charging.

Wireless Application Protocol (WAP): Introduction - WAP - MMS - GPRS Applications.

UNIT-III

(15 periods)

CDMA and 3G: Introduction - Spread-Spectrum Technology - Is-95 - CDMA Vs GSM - Wireless Data - 3G Networks & Applications

Wireless LAN: Introduction - Advantages - IEEE 802.11 Standards - Architecture - Mobility - Deploying - Mobile Ad Hoc Networks and Sensor Networks - Wireless LAN Security - WiFi Vs 3G.

Internet Networks and Interworking: Introduction - Fundamentals of Call Processing - Intelligence in the Networks - SS#7 Signaling - IN Conceptual Model - Softswitch - Programmable Networks - Technologies and Interfaces for IN.

Client Programming: Introduction - Moving Beyond the Desktop - A Peek under the Hood: Hardware Overview - Mobile Phones - PDA - Design Constraints in Applications for Handheld Devices.

UNIT-IV

(18 periods)

Programming for the PALM OS: Introduction - History of Palm OS - Palm OS Architecture - Application Development - Communication in Palm OS - Multimedia.

Wireless Devices with SYMBIAN OS: Introduction - Symbian OS Architecture - Applications for Symbian - Control and Compound Controls - Active Objects - Localization - Security on the Symbian OS.

J2ME: JAVA in the Handset - Three-Prong Approach to Java Everywhere, Java 2 Micro Edition (J2ME) - Programming for CLDC - GUI in MIDP - UI Design Issues - Multimedia - Record Management System - Communication in MIDP - Security Considerations in MIDP - Optional Packages

Wireless Devices with Windows CE: Introduction - Different Flavors of Windows CE - Windows CE Architecture - Windows CE Development Environment.

TEXT BOOKS:

1. Asoke K Talukder & Roopa R.Yavagal, "Mobile Computing - Technology Applications and Service Creation", TMH 2006.

REFERENCE BOOKS:

- 1. Uwe Hansmann, Lother Merk, Martin S.Nicklous, Thomas Staber, "*Principles of Computing*", 2/e, Springer International Edition.
- 2. J.Schiller, "Mobile communications", Addison-Wesley, 2003

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GRID COMPUTING

Lectures	:	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	•••	70

UNIT - I

GRID COMPUTING - Introduction: Early Grid Activities, Current Grid Activities, An Overview of Grid business Areas, Grid Applications. Grid Computing Organizations and Their Roles: Organizations Developing Grid Standards and Best Practice Guidelines, Organizations Developing Grid Computing Toolkits and the Framework. The Grid computing Anatomy: The Grid Problem.

The Grid Computing Road Map:

UNIT-II:

Merging the Grid Services Architecture with the Web Services Architecture: Service-Oriented Architecture, Web Service Architecture, XML, Related Technologies, and Their Relevance to Web Services, XML Messages and Enveloping, Service Message Description Mechanisms, Relationship between Web Service and Grid Service. Open Grid Services Architecture (OGSA) :Some Sample Use cases that drive the OGSA: CDC, NFS, Online Media and Entertainment. OGSA Platform Components.

UNIT -III

Open Grid Services Infrastructure (OGSI): Introduction, Grid Services, High-Level Introduction to OGSI, Technical Details of OGSI specification, Introduction to Service Data Concepts, Grid Service : Naming and Change Management Recommendations .OGSA Basic Services: Common Management Model (CMM), Service domains, Policy Architecture, Security Architecture, Metering and Accounting, Common distributed Logging, Distributed Data Access and Replication.

UNIT-IV

GLOBUS GT3 TOOLKIT: Architecture: GT3 software Architecture Model -

GLOBUS GT3 TOOLKIT: Programming Model - Introduction, Service Programming Model. GLOBUS GT3 TOOLKIT: A Sample Implementation, Acme Search Service Implementation in a Top-down Approach.

TEXT BOOK:

1. Joshy Joseph and Craig Fellenstein "Grid Computing"; Pearson Education

REFERENCE BOOKS:

- 1. Fran Berman, Geoffrey Fox, Anthony J.G. Hey, "Grid Computing: Making the Global Infrastructure a reality ", John Wiley and sons, 2003.
- 2. Ahmar Abbas, "Grid Computing: A Practical Guide to Technology and Applications", Charles River media, 2003.
- 3. D Janaki Ram "Grid Computing" TMH.

(20 periods)

(15 periods)

(15 periods)

(15 periods)

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BIOMETRICS

Lectures	•••	4 periods/week	Sessional Marks	:	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT I

IT 425 (D)

Introduction - Benefits of biometric security - Verification and identification - Basic working of biometric matching - Accuracy - False match rate - False non-match rate -Failure to enroll rate - Derived metrics - Layered biometric solutions.

UNIT II

Finger scan - Features - Components - Operation (Steps) - Competing finger Scan technologies - Strength and weakness. Types of algorithms used for interpretation.

UNIT III

Facial Scan - Features - Components - Operation (Steps) - Competing facial Scan technologies - Strength and weakness.

Iris Scan - Features - Components - Operation (Steps) - Competing iris Scan technologies -Strength and weakness.

Voice Scan - Features - Components - Operation (Steps) - Competing voice Scan (facial) technologies - Strength and weakness.

Other physiological biometrics - Hand scan - Retina scan - AFIS (Automatic Finger Print Identification Systems) - Behavioral Biometrics - Signature scan- keystroke scan.

Biometrics Application - Biometric Solution Matrix - Bio privacy - Comparison of privacy factor in different biometrics technologies - Designing privacy sympathetic biometric systems. Biometric standards - (BioAPI, BAPI) - Biometric middleware

UNIT VIII

Biometrics for Network Security. Statistical measures of Biometrics. Biometric Transactions.

TEXT BOOKS :

Biometrics - Identity Verification in a Networked World - Samir Nanavati, Michael 1. Thieme, Raj Nanavati, WILEY- Dream Tech

REFERENCE:

- Biometrics for Network Security- Paul Reid, Pearson Education. 1.
- 2. Biometrics - The Ultimate Reference- John D. Woodward, Jr. Wiley Dreamtech.

UNIT V

UNIT IV

UNIT VI

UNIT VII

(8 periods)

(7 periods)

(8 periods)

(7 periods)

(7 periods)

(7 periods)

(8 periods)

(8 periods)
CS/IT 425(E)

NATURAL LANGUAGE PROCESSING

Lectures	:	4 periods/week	Sessional Marks	••	30
University Exam	:	3 hours	University Examination Marks	:	70

UNIT - I

Introduction to Natural Language Understanding, Syntactic Processing: Grammars and Parsing

UNIT-II:

Features and Augmented Grammars, Toward Efficient Parsing, Ambiguity Resolution: Statistical Methods: Probabilistic Context-Free Grammars, Best-First Parsing.

UNIT -III

Semantic Interpretation:

Linking Syntax and Semantics, Ambiguity Resolution, other Strategies for Semantic Interpretation.

UNIT-IV

Context and World Knowledge: Using World Knowledge, Discourse Structure, Defining a Conversational Agent.

TEXT BOOK:

Natural Language Understanding - James Allen, Second Edition, Pearson Education.

REFERENCE BOOKS:

- 1. Speech and Language Processing Daniel Jurafsky, James H.Martin.
- 2. Foundations of Statistical Natural Language Processing Christopher Manning, Hinrich Schutze, MIT Press.
- 3. Artificial Intelligence, Elaine Rich and Kevin Knight, Second Edition, Tata McGraw Hill.

(15 periods)

(12 periods)

(20 periods)

(15 periods)

CS/IT 425(F)

MOBILE AD HOC NETWORKS

Lectures	 4 periods/week	Sessional Marks	••	30
University Exam	 3 hours	University Examination Marks	:	70

UNIT-I

Introduction to Wireless Networks: Evaluation of Mobile Cellular Networks, Global System for Mobile Communications (GSM), General Packet Radio Service (GPRS), Personal Communications Services (PCSs), Wireless LANs (WLAN), Universal Mobile Telecommunications System (UMTS).

Origins of Ad Hoc: Packet Radio Networks: Introduction - Technical Challenges, Architecture of PRNETs - Components of Packet Radios - Routing in PRNETs - Route Calculation - Pacing Techniques - Media Access in PRNETs - Flow Acknowledgements in PRNETs.

Ad Hoc Wireless Networks: What Is an Ad Hoc Network? - Heterogeneity in Mobile Devices -Wireless Sensor Networks - Traffic Profiles - Types of Ad Hoc Mobile Communications - Types of Mobile Host Movements - Challenges Facing Ad Hoc Mobile Networks

UNIT-II

Ad Hoc Wireless Media Access Protocols: Introduction - Problems in Ad Hoc Channel Access - Receiver & Sender Initiated MAC Protocols - Existing Ad Hoc MAC Protocols - MARCH.

Overview of Ad Hoc Routing Protocols: Table-Driven Approaches - DSDV - WRP - CSGR - Source-Initiated On-Demand Approaches - AODV - DSR - TORA - SSR, LAR - PAR - ZRP - STAR - RDMAR.

UNIT-III

Associativity-Based Long-Lived Routing: A New Routing Paradigm - Associativity-Based Long-Lived Routing - ABR Protocol Description

Implementation of Ad Hoc Mobile Networks: Introduction - ABR Protocol Implementation in Linux - Experimentation and Protocol Performance - Important Deductions.

Communication Performance of Ad Hoc Networks: Introduction - Performance Parameters of Interest - Route Discovery (RD) Time - End-to-End Delay (EED) Performance - Communication Throughput Performance - Packet Loss Performance - Route Reconfiguration/Repair Time - TCP/IP-Based Applications.

UNIT-IV

(18 periods)

(18 periods)

(12 periods)

(12 periods)

Emergency Conservation: Power Life Issues: Introduction - Power Management - Advances in Device Power Management - Advances in Protocol Power Management - Power Conservation by Mobile Applications - Periodic Beaconing On Battery Life - Standalone Beaconing - HF Beaconing with Neighboring Nodes - Comparison of HF Beaconing with and without Neighbors - LF Beaconing with Neighboring Nodes - Comparison of LF Beaconing with and without Neighbors - Deductions.

Ad Hoc Wireless Multicast Routing: Multicasting in Wired Networks - Multicast Routing in Mobile Ad Hoc Networks - Existing Ad Hoc Multicast Routing Protocols - ABAM - Comparisons of Multicast Routing Protocols

TCP over Ad Hoc: Introduction to TCP - Versions of TCP - Problems Facing TCP in Wireless Last-Hop - Problems Facing TCP in Wireless Ad Hoc - Approaches to TCP over Ad Hoc.

TEXT BOOKS:

1. C.K.Toh, "Ad Hoc Mobile Wireless Networks - Protocols and Systems", Pearson LPE.

REFERENCE BOOKS:

- 1. Charles E.Perkins, "Ad Hoc Networking", Addison-Wesley, 2001.
- 2. Y-Bing Lin and Imrich Chlamtac, "Wireless & Mobile Network Architectures", Wiley, 2001.
- 3. C.Sivaram Murthy, "Ad Hoc Wireless Networks : Architectures & Protocols", Prentice Hall.

CS/IT 461 - DATA ENGINEERING LAB USING ORACLE 9i & 10g, ORACLE OWB, INFORMATICA, Clementine Tools

Lectures	:	3 periods/week	Sessional Marks	••	25
University Exam	:	3 hours	University Examination Marks	•••	50

- I. Analyzing data with ROLLAP, CUBE.
- II. Cube slicing come up with 2-D view of data.
- III. Drill-down or Roll-down- going from summary to more detailed data.
- IV. Roll up summarize data along a dimension hierarchy.
- V. Dicing projecting 2-D view of data.
- VI. Creating Star Schema/snowflake Schema.
- VII. Create and populate FACT table.
- VIII. Building dimensions.

IX. ETL : Extraction Options

- i. Full extraction
- ii. Incremental extraction
- iii. Change Data Capture(CDC)

X. ETL: Transformation Options

- iv. Transformation: during extraction, in staging area, during load, etc.
- v. Multi-state transformation
- vi. Pipelined transformation

XI. ETL: DW Load options

- vii. Loader: SQL(DML)
- viii. Data Pump

XII. DW index design options

- ix. B*tree index how they work
- x. Bitmapped index how they work
- xi. NULL value considerations

TEXT BOOKS & WEB REFERENCES:

1. Oracle 10G & 9i Oracle Press Manual.

CS/IT 462

PROJECT WORK

Lectures	:	9 periods/week	Sessional Marks	:	50
University Exam	:	3 hours	University Examination Marks		100

The Project work shall be carried out by a batch consisting not more than four students for one semester. It should help the students to comprehend and apply different theories and technologies that they have learnt through and are learning. It should lead to a substantial result as a comparative study, a new application of the technologies available or some extension to the works carried out by some researcher and published in referred journals. Each batch must carryout the analysis, design, implementation and testing of the entire project basing on the Software Engineering principles. There shall be a total of four reviews made by the batch regarding:

1.	0 th review	:	The idea/concept which forms the basis for their project shall be presented to the guide, concerned incharge and
			classmates and shall get the approval for continuation.
2.	1 st review	:	The analysis and design carried out.
3.	2 nd review	:	The implementation and the testing done.
4.	3rd review	:	Over all presentation of the work carried out and the results found out for the valuation under the internal assessment.

A comprehensive report on the lines of IEEE Format is to be submitted at the end of the semester, which is certified by the concerned guide and the HOD.

There shall be an external guide appointed by the University to make an assessment and to carryout the Viva-Voce examination.