ANNAMALAI UNIVERSITY

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

B.E. INFORMATION TECHNOLOGY

(Four Year Degree Programme)
(Choice Based Credit System)
(FULL–TIME)
REGULATIONS AND SYLLABUS
REGULATIONS

CREDITS

Each course is normally assigned one credit per lecture/tutorial per week and one credit for two periods or part thereof for laboratory or practical per week.

Each semester curriculum shall normally have a blend of theory and practical courses. In the first year the total number of credits will be 32. For semesters III to VIII the average credits per semester will be 28 and total credits for the entire degree course will be 200. For the award of the degree a student has to

1) Earn a minimum of 200 credits,

2) Serve in the NSS or NCC for at least one year, and

3) Enrol as student member of a recognised professional society.

DURATION OF THE PROGRAMME

A student is normally expected to complete the B.E. Information Technology Programme in four years but in any case not more than seven years from the time of admission.

REGISTRATION FOR COURSES

A newly admitted student will automatically be registered for all the courses prescribed for the first year, without any option.

Every other student shall submit a completed registration form indicating the list of courses intended to be credited during the next semester. This registration will be done a week before the last working day of the current semester. Late registration with the approval of the Dean on the recommendation of the Head of the Department along with a late fee will be done up to the last working day.

Registration for the project work shall be done only for the final semester.

ASSESSMENT

The subjects of study, scheme of assessment and syllabus are enclosed

The break-up of assessment and examination marks for theory subjects is as follows.

First assessment	:	10 marks
Second Assessment (mid semester test)	:	20 marks
Third assessment	:	10 marks
Examination	:	60 marks

The break-up of assessment and examination marks for practical subjects is as follows.

First assessment (test)	:	15 marks
Second assessment (test)	:	15 marks
Maintenance of record book	:	10 marks
Examination	:	60 marks

The project work will be assessed for 40 marks by a committee consisting of the guide and a minimum of two members nominated by the Head of the Department. One of the committee members will be nominated as the chairman by the Head of the Department. The Head of the Department may himself be a member or the Chairman. 60 marks are allotted for the project work and viva voce examination at the end of the semester.

STUDENT COUNSELLOR

To help the students in planning their course of study and for general advice on the academic programme, the Head of the Department will attach a certain number of students to a member of the faculty who shall function as student counsellor for those students throughout their period of study. Such student counsellors shall advise the students, give preliminary approval for the courses to be taken by the students during each semester and obtain the final approval of the Head of the Department.

CLASS COMMITTEE

For all the branches of study during the first year, a common class committee will be constituted by the Dean of the faculty.

From among the various teachers teaching the same common course to different classes during the first year, the Dean shall appoint one of them as course co-ordinator.

The composition of the first year class committee will be as follows.

Course co-ordinators of all common courses.

Teachers of all other individual courses.

All Heads of the Departments, among whom one may be nominated as chairman by the Dean.

The Dean may opt to be a member or the chairman.

For each of the higher semesters, separate class committees will be constituted by the respective Heads of Departments.

The composition of the class committees from third to eighth semester will be as follows.

Course co-ordinators of the common courses, if any, who shall be appointed by the Head of the Department from among the staff members teaching the common course.

A project co-ordinator (in the eighth semester committee only) who shall be appointed by the Head of the Department from among the project supervisors.

Teachers of other individual courses.

One Professor or Reader, preferably not teaching the concerned class, appointed as Chairman by the Head of the Department.

The Head of the Department may opt to be a member or the Chairman.

All student counsellors of the class, and the Head of the Department (if not already a member) or any staff member nominated by the Head of the Department may opt to be special invitees.

The class committee shall meet four times during the semester.

The first meeting will be held within two weeks from the date of class commencement in which the type of assessment like test, assignment etc. for the first and third assessment and the dates of completion of the assessments will be decided.

The second meeting will be held within a week after the completion of the first assessment to review the performance and for follow-up action.

The second assessment will be the mid-semester test.

The third meeting will be held within a week after the second assessment is completed to review the performance and for follow-up action.

The fourth meeting will be held after all the assessments except the examinations are completed for all the courses, and at least one week before the commencement of the examinations. During this meeting the assessment on a maximum of 40 marks will be finalised for every student and tabulated and submitted to the Head of the Department (to the Dean in the case of first year) for approval and transmission to the controller of examinations.

WITHDRAWAL FROM A COURSE

A student can withdraw from a course at any time before a date fixed by the Head of the Department prior to the second assessment, with the approval of the Dean of the Faculty on the recommendation of the Head of the Department.

TEMPORARY BREAK OF STUDY

A student can take a one-time temporary break of study covering the current year/semester and/or the next semester with the approval of the Dean on the recommendation of the Head of the Department, not later than seven days after the completion of the mid-semester test. However, the student must complete the entire programme within the maximum period of seven years.

SUBSTITUTE ASSESSMENTS

A student, who has missed, for genuine reasons accepted by the Head of the Department, one or more of the assessments of a course other than the examination, may take a substitute assessment for any one of the missed assessments. The substitute assessment must be completed before the date of the fourth meeting of respective class committees.

A student who wishes to have a substitute assessment for a missed assessment must apply to the Head of the Department within a week from the date of the missed assessment.

ATTENDANCE REQUIREMENTS

To be eligible to appear for the examination in a particular course, a student must put in a minimum of 80% of attendance in that course. However, if the attendance is 75% or above but less than 80% in any course, the authorities can permit the student to appear for the examination in that course on payment of the prescribed condonation fee.

A student who withdraws from or does not meet the minimum attendance requirement in a course must re-register for and repeat the course.

PASSING AND DECLARATION OF EXAMINATION RESULTS

All assessments of all the courses on an absolute marks basis will be considered and passed by the respective results passing boards in accordance with the rules of the University. Thereafter, the controller of examinations shall convert the marks for each course to the corresponding letter Grade as follows, compute the Grade Point Average (GPA) and Overall Grade Point Average (OGPA) and prepare the Grade cards.

90 to 100 marks	:	Grade 'S'
80 to 89 marks	:	Grade 'A'
70 to 79 marks	:	Grade 'B'
60 to 69 marks	:	Grade 'C'
55 to 59 marks	:	Grade 'D'
50 to 54 marks	:	Grade 'E'
Less than 50 marks	:	Grade 'F'
Insufficient attendance	:	Grade 'I'
Withdrawn from the course	:	Grade 'W'

A student who obtains less than 24 marks out of 60 in the examination or is absent for the examination will be awarded Grade 'F'.

A student who earns a Grade of S, A, B, C, D or E for a course is declared to have successfully completed that course and earned the credits for that course. Such a course cannot be repeated by the student.

A student who obtains letter Grade F in a course has to reappear for the examination in that course.

A student who obtains letter Grades I or W in a course must reregister for and repeat the course.

The following Grade Points are associated with each letter Grade for calculating the Grade Point Average (GPA) and Overall Grade Point Average (OGPA).

S - 10; A - 9; B -8; C - 7; D - 6; E - 5; F – 0

Courses with Grades I and W are not considered for calculation of Grade Point Average or Cumulative Grade Point Average. F Grade will be considered for computing GPA and OGPA.

A student can apply for retotalling of one or more of his/her examination answer papers within a week from the date of issue of Grade sheet to the student on payment of the prescribed fee per paper. The application must be made to the controller of examinations with the recommendation of the Head of the Department.

After results are declared, Grade cards will be issued to the students.

The Grade card will contain the list of courses registered during the year/semester, the Grades scored and the Grade Point Average (GPA) for the year/semester.

GPA is the sum of the products of the number of credits of a course with the Grade Point scored in that course, taken over all the courses for the year/semester, divided by the sum of the number of credits for all courses taken in that year/semester. OGPA is similarly calculated considering all the courses taken from third semester.

After successful completion of the programme, the degree will be awarded with the following classifications based on OGPA.

For First Class with distinction the student must earn a minimum of 200 credits within four years from the time of admission, pass all the courses in the first attempt and obtain an OGPA of 8.25 or above.

For First Class the student must earn a minimum of 200 credits within five years from the time of admission and obtain a OGPA of 6.75 or above.

For Second Class the student must earn a minimum of 200 credits within seven years from the time of admission.

ELECTIVES

Apart from the various elective courses offered in the curriculum of the branch of specialisation, a student can choose a maximum of two electives from any specialisation under the faculty during the entire period of study, with the approval of the Head of the Department and the Head of the Department offering the course.

SUBJECTS OF STUDY AND SCHEME OF ASSESSMENT

(For those who joined B.E from the academic year 2007-2008 onwards)

FIRST YEAR (ANNUAL PATTERN)

No	Code No	Course Title	L	T	P	D	Marks			Credit Points
							Ex	CA	Total	
THEORY (Duration of Examination – 3 Hrs)										
1	101	Technical English	3				60	40	100	3
2	102	Engineering Mathematics - I	3	1			60	40	100	4
3	103	Engineering Physics	3				60	40	100	3
4	104	Engineering Chemistry	3				60	40	100	3
5	105	Engineering Mechanics	3				60	40	100	3
6	106	Basic Engineering (Civil, Mech. & Elect.)	6				60	40	100	3
7	107	Environmental Studies	3				60	40	100	3
PRACTICAL (Duration of Examination – 3 Hrs)										
8	108	Engineering Drawing	-	-	-	3	60	40	100	2
9	109	Physics Laboratory	-		3		60	40	100	2
10	110	Chemistry Laboratory	-				60	40	100	2
11	111	Computer Programming	1		2		60	40	100	2
12	112	Workshop Practice	-		3		60	40	100	2
		Total	25	1	8	3	720	480	1200	32

L - Lecture, T - Tutorial, P - Practical, D – Drawing, Ex. – Examination, CA – Continuous Assessment

THIRD SEMESTER

Code No.	Course Name	L	T	Lb	D	Sessional	Exam Marks	Total Marks	Credits
93108	Engineering Mathematics – II	3	1	-	3	40	60	100	4
93208	Digital Principles and System Design	3	1	-	3	40	60	100	3
93308	Electronic Devices and Circuits	3	1	-	3	40	60	100	3
93408	Computer Architecture	3	1	-	3	40	60	100	4
93508	Data Structure and Algorithms	3	1	-	3	40	60	100	4
93608	C Programming	3	1	-	3	40	60	100	4
93708	Electronics Devices and Circuits Lab	-	-	6	3	40	60	100	3
93808	Data Structure Lab	-	-	6	3	40	60	100	3
	TOTAL	**18**	**6**	**12**	**24**	**320**	**480**	**800**	**28**

L - Lecture, T - Tutorial, Lb- Laboratory, D – Duration of the Examination

FOURTH SEMESTER

Code No.	Course Name	L	T	Lb	D	Sessional	Exam marks	Total marks	Credits
94108	Discrete Mathematical Structure	3	1	-	3	40	60	100	3
94208	Signals and Systems	3	1	-	3	40	60	100	4
94308	Microprocessor and Microcontrollers	3	1	-	3	40	60	100	3
94408	Object oriented Programming and Modelling	3	1	-	3	40	60	100	4
94508	Operating Systems	3	1	-	3	40	60	100	4
94608	Principles of Communication Engineering	3	1	-	3	40	60	100	4
94708	Object Oriented Programming Lab	-	-	6	3	40	60	100	3
94808	Microprocessor Lab	-	-	6	3	40	60	100	3
	TOTAL	**18**	**6**	**12**	**24**	**320**	**480**	**800**	**28**
FIFTH SEMESTER									
95108	Data Base Management Systems	3	1	-	3	40	60	100	3
95208	Internet and Java Programming	3	1	-	3	40	60	100	4
95308	Numerical Mathematics and Operations Research	3	1	-	3	40	60	100	3
95408	Unix and Windows Programming	3	1	-	3	40	60	100	4
95508	Elective – I	3	1	-	3	40	60	100	4
95608	Elective – II	3	1	-	3	40	60	100	4
95708	Unix and RDBMS Lab	-	-	6	3	40	60	100	3
95808	Operating System and Java Programming Lab	-	-	6	3	40	60	100	3
	TOTAL	**18**	**6**	**12**	**24**	**320**	**480**	**800**	**28**
SIXTH SEMESTER									
96108	Computer Graphics and Multimedia	3	1	-	3	40	60	100	3
96208	Visual Programming	3	1	-	3	40	60	100	4
96308	Data Communication	3	1	-	3	40	60	100	3
96408	Digital Signal Processing	3	1	-	3	40	60	100	4
96508	Elective – III	3	1	-	3	40	60	100	4
96608	Elective – IV	3	1	-	3	40	60	100	4
96708	Graphics and Multimedia Lab	-	-	6	3	40	60	100	3
96808	Visual Programming Lab	-	-	6	3	40	60	100	3
	TOTAL	**18**	**6**	**12**	**24**	**320**	**480**	**800**	**28**
SEVENTH SEMESTER									
97108	Principles of Management	3	1	-	3	40	60	100	4
97208	Computer Networks	3	1	-	3	40	60	100	3
97308	Software Engineering	3	1	-	3	40	60	100	3
97408	Information Coding Techniques	3	1	-	3	40	60	100	4
97508	Elective – V	3	1	-	3	40	60	100	4
97608	Elective – VI	3	1	-	3	40	60	100	4
97708	Network Programming Lab	-	-	6	3	40	60	100	3
97808	Digital Signal Processing and Information Coding Techniques Lab	-	-	6	3	40	60	100	3
	TOTAL	**18**	**6**	**12**	**24**	**320**	**480**	**800**	**28**

L - Lecture, T - Tutorial, Lb- Laboratory, D – Duration of the Examination

EIGHTH SEMESTER

Code No.	Course Name	L	T	Lb	D	Sessional	Exam marks	Total marks	Credits
98108	Telecommunication Switching and Networks	3	1	-	3	40	60	100	3
98208	Ethics in Engineering	3	1	-	3	40	60	100	4
98308	Network Security	3	1	-	3	40	60	100	3
98408	Elective – VII	3	1	-	3	40	60	100	4
98508	Elective – VIII	3	1	-	3	40	60	100	4
98608	Elective – IX	3	1	-	3	40	60	100	4
98708	Project Work and Viva-voce	-	-	6	3	40	60	100	6
	TOTAL	**18**	**6**	**6**	**21**	**280**	**420**	**700**	**28**

LIST OF ELECTIVES

9XX08A	:	C# and .Net Programming
9XX08B	:	Image Processing
9XX08C	:	Data Warehousing and Mining
9XX08D	:	Speech Processing
9XX08E	:	Satellite Communication and Broad Casting
9XX08F	:	Enterprise Resource Planning
9XX08G	:	Parallel Algorithms
9XX08H	:	Client Server Computing
9XX08I	:	E-Commerce
9XX08J	:	Natural Language Processing
9XX08K	:	Pervasive Computing
9XX08L	:	Neural Networks and Fuzzy systems
9XX08M	:	Theory of Computation
9XX08N	:	Mainframe Softwares
9XX08O	:	Web Technology
9XX08P	:	Mobile Computing
9XX08Q	:	Compiler Design
9XX08R	:	High speed networks
9XX08S	:	Advanced Wireless Communication
9XX08T	:	Software Project Management
9XX08U	:	TCP/IP Network Components
9XX08V	:	Distributed Objects–COM/DCOM
9XX08W	:	Distributed Computing
9XX08X	:	Unified Modeling Language
9XX08Y	:	JSP and EJB

SYLLABUS
THIRD SEMESTER
93108 : ENGINEERING MATHEMATICS – II

AIM

- The course aims to develop the Skills of the Students in the areas of boundary value problems and transform techniques. This will be necessary for their effective studies in a large number of engineering subjects like heat conduction, Communication systems, Electro-Optics and Electromagnetic theory. The Course will also serve as a prerequisite for post graduate and specialized studies and research.

OBJECTIVES

- At the end of the Course the students would be capable of mathematically formulating certain practical problems in terms of partial differential equations, solve them and physically interpret the results
- Have gained a well founded knowledge of Fourier series, their different possible forms and the frequently needed practical Fourier analysis that an engineer may have to make from discrete data
- Have obtained capacity to formulate and identify certain boundary value problems encountered in engineering practices, decide on applicability of the Fourier series method of solution, solve them and interpret the results.
- Have grasped to concept of expression of a function, under certain conditions, as a double integral leading to identification of transform pair, and specialization on Fourier transform pair, their properties, the possible special cases with attention to their applications
- Have learnt the basics of Z transform in its applicability to discretely varying functions, gained the skill to formulate certain problems in terms of difference equations and solve them using the Z-transform technique bringing out the elegance of the procedure involved.

Unit–I : Partial Differential Equations

Formation of partial differential equations by elimination of arbitrary constants and arbitrary functions – Solution of standard types of first order partial differential equations – Lagrange's linear equation – Linear partial differential equations of Second order with Constant coefficients.

Unit–II : Fourier Series

Dirichlet's Conditions – General Fourier Series – Odd and even functions – Half range sine series – Half range cosine Series – Complex form of Fourier series – Parseval's identity.

Unit–III : Boundary Value Problems

Solutions of one dimensional Wave equation – One dimensional heat equation (without derivation) – Fourier series solutions in Cartesian Co-ordinates.

Unit–IV : Fourier Transform

Fourier integral theorem(without proof) – Fourier transform pair Sine and Cosine transforms – Properties – Transforms of simple functions – Convolution theorem – Parseval's identity.

Unit–V : Z – Transform and Difference Equations

Z – transform – Elementary Properties – Inverse Z – transform – Convolution theorem – Solution of difference equations using Z – transform.

Text Books

1) Kandasamy P, Thilagavathy, K and Gunavathy K, "Engineering Mathematics Series", S.Chand & Co. Ltd., New Delhi, 2004.
2) Venkatraman M.K, "Engineering Mathematics Series", The National Publication Company, Chennai, 2003.

References

1) Veerarajan, T., "Engineering Mathematics' Series, Tata McGraw Hill Publication Company Ltd, New Delhi, 2002.
2) Singaravelu A, "Engineering Mathematics" Series, Meenakshi Publication, Chennai, 2004.
3) Wylie C Ray and Barrett Louis, C., "Advanced Engineering Mathematics", McGraw Hill Inc., New York.

93208 : DIGITAL PRINCIPLES AND SYSTEM DESIGN

AIM

- To learn the Basic Concepts of Boolean Algebra, Combinational logic and sequential Logic circuits which are important in describing the Operations among various modules in digital system.

Unit–I : Binary Systems and Boolean Algebra:

Signed binary numbers – Binary arithmetic in computers – BCD arithmetic – Data representation – Fixed and floating point representation – Exponent representation of floating point binary numbers – Weighted and non weighted binary codes – alphanumeric codes – Error detection and correction codes – Laws of boolean algebra – Boolean expansions and logic diagrams – Negative logic – Introduction to mixed logic.

Unit–II : Logic Families

Specifications of a logic circuit – Operation and characteristics of RTL – DTL – HTL – TTL – ECL – MOS – CMOS and logic families – Comparison of logic families – Open collector – totem pole – Schottky and tristate TTL gates – wire – ANDing – strobed gate – expanders and expandable gates – Logic packages SSI – MSI – LSI – VLSI – and VVLSI

Unit–III : Combinational Logic

Introduction – Minterms and Maxterms – Truth tables and maps – Solving digital problems using maps – Sum of products and Product of sums reduction – Tabular minimization – Hybrid functions – Incompletely specified functions – Multiple output minimization – Implementation of expressions using AOI gates. Fault diagnosis in combinational circuits – Classical method – Boolean difference method.

Unit–IV : Sequential Logic

Flip – flops – Counters – Types of counters – Type T – Type D and type JK design – Design using state equations – Shift registers – Asynchronous sequential circuits – Fault diagnosis in sequential circuits – Initial and final state identification.

Unit–V : Digital Integrated Circuits

Multiplexer – Demultiplexer – Decoder – code converter – Arithmetic functions – D/A – A/D converters. Memory circuit and systems – ROM – PROM – EPROM – EEPROM – RAM – DRAM – Memory Subsystems – PLA – PAL series PLD's – architecture – notations – design methodology – FPGA – logic blocks – Architecture – programming technologies.

Text Books

1) Samuel C Lee, "Digital Circuits and Logic Design", PHI, 1984.
2) Morris Mano, "Digital Logic and Computer Design", PHI, 1994.

References

1) Kohonen, "Switching and Finite Automata Theory", TMH, 1978.
2) Jacob Millman and Arvin Grabel, "Microelectronics" McGraw Hill, 1987.
3) William I. Fletcher, "An Engineering approach to Digital Design", PHI, 1996.

93308 : ELECTRONIC DEVICES AND CIRCUITS

Aim

- To learn the various electronic circuits like rectifiers, filters, regulators, amplifiers, waveform generators and Converters**.**

Unit–I

Power supplies: Rectifiers – Half wave and full wave rectifiers – Three phase full wave rectifier – Ripple Factor – Transformer utilization factor – Efficiency – Filters: Inductor filters, Capacitor filters – Voltage Regulator – Series and shunt type Regulators – Switched mode Regulators – Three terminal voltage regulators.

Unit–II

Amplifiers Circuits and Systems: General principles of operations – CB amplifiers – RC coupled amplifiers – Voltage, Current and power gain – Transformer coupled amplifiers – Multi stage amplifiers – Darlington Pair – Feedback amplifier – Negative Feedback amplifier – Push pull amplifiers – Power dissipation and conversion efficiency

Unit–III

Operational amplifiers (Op-Amp): Properties of ideal Op-Amps – Non-inverting and inverting amplifiers – Integrators – Differentiator – weighted summer and other applications of Op – Amp circuits.

General purpose Op-Amp: DC analysis – small – signal analysis of different stages – gain and frequency response of 741 Op-Amp. Negative feedback: properties – basic topologies – feedback amplifiers with different topologies – stability – frequency compensation.

Unit–IV

Wave Form Generator And Wave Shaping: Sinusoidal oscillators – Crystal oscillators – Multivibrators – Comparators – Schmitt trigger – square wave and triangular wave generation – Pulse generation – 555 – IC timer – Modulation of a square wave – Series regulator – Monolithic voltage regulator.

Unit–V

Signal Conditioning And Data Conversion: Signals and signal processing – Sample and Hold systems – Analog multiplexer and demultiplexer – D/A converter – A/D converters.

Text Books

1) Jacob Millman and Arvin Grabel, “Micro Electronics”, Second Edition McGraw Hill, 1998.
2) Milman and Halkias, "Integrated Electronics", McGraw Hill. 1990.
3) Allen Mottershed, "Electronic Devices and Circuits", Prentice Hall of India, 1981.

References

1) Sedra, S. and K.C.Smith, "Microelectronic Circuits", 5th edition, Oxford University Press, 2003.
2) Malvino, P. and J.A. Brown, "Digital Computer Electronics", 3rd edition McGraw Hill, 1992.

93408 : COMPUTER ARCHITECTURE

AIM

- To study about the design of instruction set, pipelining, memory system and multiprocessors and multicomputers.

Unit–I : Introduction

Overview and History – The Cost Factor – Performance Metrics and Evaluating Computer Design – Memory Hierarchy – System Buses – Bus Inter Connection – PCI – Future bus. Overview of CPU (ALU and control unit) design.

Unit–II : Instruction Set Design

Assembly/Machine Language – Von Neumann Machine Cycle – Microprogramming – Firmware – Memory Addressing – Classifying Instruction Set Architectures – RISC VS CISC.

Unit–III : Pipelining

Comparison of Pipelined and non Pipelined Computers – Instruction and Arithmetic Pipelines – Structural Hazards and Data Dependencies – Branch Delay and multicycle instructions – Superscalar Computers.

Unit–IV: Memory System Design

Cache Memory – Basic Cache structure and Design – Fully associative – Direct and Set Associative Mapping – Analyzing Cache Effectiveness – Replacement Policies – Main Memory – Virtual Memory Structure and Design – Paging – Replacement Strategies – Secondary Memory.

Unit–V : Multiprocessors and Multicomputers

SISD – SIMD and MIMD architectures – Centralized and Distributed Shared Memory – Architectures – Cache Coherence.

Text Book

1) Hennessy, J. and D. Patterson – Morgan and Kaufmann” Computer Architecture – A Quantitative Approach”, Second Edition, 1996.

References

1) John, P. Hayes, “Computer Architecture and Organization”, Tata McGraw Hill, 1996.
2) Hamatcher, V.C., et al “Computer Organization”, Tata McGraw Hill, 1996.

93508 : DATA STRUCTUERS AND ALGORITHMS

AIM

- To understand the concepts of data structures such as stack, queue, linked list, tree, graphs and searching and sorting algorithms.

Unit–I

Arrays: Representation of arrays. Stacks and Queues: Fundamentals – Evaluation of expression – Infix to Postfix Conversion – Multiple Stacks and Queues – Performance Analyze of the algorithms.

Unit–II

Linked List: Singly Linked List – Linked Stacks and Queues – Polynomial Addition – More on Linked List – Sparse Matrices – Doubly Linked List and Dynamic – Storage Management – Garbage Collection and Compaction.

Unit–III

Binary Trees : Trees – Binary Tree – Binary search Trees – Implementation of Binary Trees – Searching a Binary search Tree – Tree Traversal – Insertion – Deletion – Balancing a Tree – Self – Adjusting Trees – Heaps – Polish notation and Expression Trees.

Unit–IV

Graphs: Terminology and Algorithms. Hashing – Hashing Functions – collision Resolution Techniques. Sorting and Searching algorithms: Bubble sort – Selection Sort – Insertion Sort – Quick sort – Merge Sort – Heap sort – Radix Sort – Binary search and Sequential search.

Unit–V

Case study: Recursion – Towers of Hanoi – Simulation of an Airport – Pattern Matching in strings – Game Trees.

Text Book

1) Aho Alfred V., Hopperoft John E., UIlman Jeffrey D., “Data Structures and Algorithms”, Addison Wesley, 1987.

References

1) Tremblay Sorenson, “An Introductions to Data Structures with Applications”, 2nd edition, Tata McGraw Hill Pub, Company Ltd.,1991
2) Yedidyah Langsam, Moshe J.Augenstein, Aaron M. Tenenbaum, “Data Structures Using C”, Prentice, Hall, 1996.

93608 : C PROGRAMMING

AIM

- To learn character set, data types, statements, functions, structure, input/output operations, pointers, files etc., available in ‘C’ language inorder to write ‘C’ programs.

Unit–I

Introduction – The C Character set – Constants – Variables and Keywords – Types of C Constants – Integer Constants – Rules for constructing Real Constants – Rules for constructing Character Constants – Types of C Variables – Variable names – C Keywords – Receiving Input – C Instructions – Type Declaration

Instruction – Arithmetic Instruction – Integer and Float Conversions – Type Conversion in Assignments – Hierarchy of operations – Associativity of operators – Control Instructions in C.

Unit–II

Data Types – Integers – long and short Integers – signed and unsigned – Characters – signed and unsigned – Floats and doubles – Enumerated data types – Uses of Enumerated Data Type – Renaming Data types with typed – Type casting – Arrays – Definition – Declaring Array – Array Initialization – Bounds Checking – Two Dimensional Arrays – Initializing a 2 – Dimensional Array – Multidimensional Array – Initialization – Storage Classes in C – Automatic – Register – Static – Externals – The Decision Control Structure: The if statement – The If – else Statement – Use of Logical Operators – conditional operator – Loop Control Structure: The break statement – Continue statement – Decisions Using switch – – switch Versus If – else Ladder.

Unit–III

Functions and Structure – Function Declaration – Passing Values between Functions – Scope Rule of Functions – calling convention – and prototypes – Call by Value and Call by reference – Structures – Declaring a Structure – Accessing Structure Elements – Array of Structures – Additional Features of Structures – Uses of Structures – Strings – Standard Library String Functions – Two Dimensional Array of characters.

Unit–IV

File Input/Output – File Operations – opening a File – Reading From a file – Trouble in Opening a File – Closing the file – A File – Copy Program – Writing to a File – File Opening Modes – String (line) I/O in Files – The Awkward Newline – Record I/O in Files – Text Files and Binary Files – Bitwise Operators – Right Shift Operator – Left Shift Operator – Bitwise AND Operator – Bitwise OR Operator – Bitwise XOR Operator.

Unit–V

Introduction to Pointers: The & and * Operators – Pointer expressions – The Jargon of pointers – char – int and float pointers – Passing addresses to functions – Function returning pointers – pointers and Arrays – Passing an Entire Array to a Function – Passing Array Elements to a Function – Pointers and Two Dimensional Arrays – Pointer to an Array – Passing Two Dimensional Array to a Function.

Text Books

1) Yashavant P. Kanetkar," Let us C", Sixth Edition BPB Publications, 2002.
2) Yashavant P. Kanetkar, "Understanding Pointers in C", Third Edition BPB Publications, 2002.

References

1) Kerningham, B.W. and D. Ritchie, "The C Programming Language", PHI, Ltd., 1988.
2) Balagurusamy, E., "Programming in ANSI C", TMH Ltd., 1995.
3) Ravichandran, D., "Programming in ANSI C", New Age International (P) Ltd, 1989.
4) Geoff Dromey, "How to Solve it by Computer?", PHI Ltd, 1988.

FOURTH SEMESTER

94108 : DISCRETE MATHEMATICAL STRUCTURE

AIM

- The Course is aimed at developing skills of Discrete Mathematics. Discrete Mathematics is a bridge connecting various branches of Computer Science and Mathematics. The topics introduced will serve as basic tools for to develop the various Concepts of Computer Science.

OBJECTIVES

On completion of the Course the Students are expected to know the following.

- The theory of sets which is the most fundamental concept in modern mathematics.
- The Idea of a relation between the elements of two sets.
- The Idea of Functions.
- Logic that deals with the methods of reasoning with studying arguments and conclusions.
- Detailed study of Semi groups, monoids and groups.
- Group codes and procedure for generating group codes.
- The study on ordering relations, Lattices and Boolean algebra.
- Graphs, especially trees and binary trees are used widely in the representation of data structures.

Unit–I

Set Theory: Introduction – Sets – Notation and Description of sets – subjects – Operations on Sets – Properties of Set operations – The principle of Duality.

Relations: Cartesian product of two Sets – Relations – representation of a relation – Operations on relation – equivalence relation – Closures and warshall's Algorithm – Partitions and Equivalence Classes.

Functions: Functions and operators – one – to – one, onto functions – special type of functions – invertible functions – composition functions.

Unit–II

Logic: Introduction – Connectives – Atomic and Compound statements Well formed formulae – Tautology – implications – Equivalence – Functionally complete sets of Connectives and duality Law – Normal forms – Theory of Inference – Quantifiers – valid formulae and Equivalence – Theory of Inference for Predicate Calculus.

Unit–III

Algebric Systems: Binary operation – Algebraic Systems – Semi groups and monoids – Homomorphism and Isomorphism of semi groups and monoids – Groups – order of a Group – Subgroup of a group – Cyclic groups.

Coding Theory: Introduction Hamming Distance Encoding a message – Group codes – procedure for Generating Group codes – Decoding and Error correction – simple Error correcting code.

Unit–IV

Lattices and Boolean Algebra: Lattices – Some properties of lattices – New lattices – Modular and Distributive lattices – Boolean Algebras – Boolean Polynomials – Karnaugh Map.

Unit–V

Graph Theory: Basic concepts – matrix representation of Graphs – Trees – Spanning trees – Shortest path problem – Directed trees, Binary Trees – Cutsets and cut – Vertices – Eulerian and Hamiltonian Graphs – Networks – Planar graphs.

Text Books

1) Dr. M.K. Venkataraman, Dr N. Sridharan, N. Chandrasekaran, "Discrete Mathematics", The National Publishing Company Chennai, (Chapters I,II,III,VII (1 to 10), VIII, IX, X and XI)

References

1) Trembley. J.P and R.P. Manohar, "Discrete Mathematical Structures with Applications to Computer Science", Tata McGraw Hill, New Delhi.
2) Bernard Kolman, Robert C. Busby and Shoran Ross, "Discrete Mathematical structures", Prentice Hall of India Ltd, New Delhi.

94208 SIGNALS AND SYSTEMS

Aim

- To learn the concepts of signals and systems. These concepts are the basis for studying digital signal processing, Image Processing etc.,

Unit–I

Signals basics: Definitions – Classifications of signals – Elementary signals – Operations on signals – Convolution – Problems

Systems basics: Definitions – Classifications of systems and basic system properties – Problems.

Unit–II

Fourier Series: Introduction – response of LTI systems to complex exponentials – Fourier series representation of continuous – time periodic signals – Convergence of the Fourier series – Properties – Problems.

Fourier series representation of discrete – time periodic signals – properties of discrete – time Fourier series – Problems

Continuous – time Fourier Transform: Representation of a periodic signals – Fourier transform of periodic signals and their properties – Convolution integral

Unit–III

Discrete – time Fourier transforms (DTFT): Representation of aperiodic signals – Fourier transform of periodic signals – Properties – Convolution sum.

Discrete Fourier Transforms (DFT): Introduction – Properties of DFT – Circular convolution and linear convolution.

Sampling: Introduction – representation of continuous – time signals by its samples – Sampling theorem – Reconstruction of a signal from its samples using interpolation; the effect of undersampling – aliasing.

Unit–IV

Laplace Transform: Introduction – Laplace Transforms – the region of convergence – Inverse Laplace transforms – Analysis and characterization of LTI systems using the Laplace transforms – Unilateral Laplace transform.

Unit–V

System realization through block – diagram representation and system inter connection – Applications of signal and system theory.

Text Books

1) Oppenheim, A.V., A.S. Willsky and I.T. Young, "Signals and Systems", Prentice Hall, 2002.
2) Salivahanan, S., A. Vallavaraj, and C. Gnanapriya, “Digital Signal Processing”, Tata McGraw Hill., 2002.
3) Nagrath, J., S.N. Sharan, R. Ranjan, S. Kumar, "Signals and Systems", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001.

References

1) John G. Proakis and Dimitris G. Manolakis, “Digital Signal Processing Principles, Algorithms and Applications, 3rd edition, Prentice Hall of India Pvt., Ltd. 2002.
2) Sanjit K. Mitra, “Digital Signal Processing – A Computer Based Approach”, Tata McGraw Hill, 2002.
3) Ramesh Babu, P., “Digital Signal Processing”, Third Edition, Scitech Publications India Pvt. Ltd. 2006.

94308 : MICROPROCESSOR AND MICROCONTROLLERS

AIM

- To understand about microprocessor, microcontroller, design methods and interfacing techniques to digital systems.

Unit–I : 8 – BIT MICROPROCESSOR

Introduction – Evolution of Microprocessor 8085 Architecture and Memory – interfacing I/O devices – Instruction set – Addressing Modes – Assembly language programming – Counters and time delays – Interrupts – Timing diagrams – Microprocessor applications.

Unit–II : Microcontroller

Intel 8031/8051 Architecture – Special Function Registers (SFR) – I/O pins – ports and circuits – Instruction set – Addressing Modes – Assembly language programming – Timer and counter programming – Serial Communication – Connection to RS 232 – Interrupts Programming – External Memory facing – Introduction to 16 bit Microcontroller.

Unit–III : 80X86 Processors

8086 Architecture – Pin Configuration – 8086 Minimum and Maximum mode configurations – Addressing modes – Basic Instructions – 8086 Interrupts – Assembly levels programming – Introduction to 80186 – 80286 – 80386 – 80486 and Pentium processors.

Unit–IV : Peripherals and Interfacing

Serial and parallel I/O (8251 and 8255) – Programmable DMA Controller (8257) – Programmable interrupt controller (8259) – Keyboard display ADC/DAC interfacing – Inter integrated circuits interfacing (I2C standard).

Unit–V: Microprocessor Based Systems Design – Digital Interfacing

Interfacing to alpha numeric displays – Interfacing to liquid crystal display (LCD 16x2 line) – High power Devices and Optical motor shaft encoders – Stepper motor interfacing – Analog interfacing and Industrial control – Microcomputer based small scale – Industrial process control system – Robotics and Embedded control – DSP and Digital Filters.

Text Books

1) Ramesh S. Gaonkar, "Microprocessor Architecture Programming and Applications with 8085", Fourth Edition, Penram International Publishing 2000.
2) Muhammad Ali Mazidi, Janice Gillespie Mazidi, "The 8051 Microcontroller", Prentice Hall, 2000.
3) Douglas V. Hall, "Microprocessor and Interfacing, Programming and Hardware", Tata McGraw Hill, Second Edition, 1999.

References

1) Kenneth J. Ayala., "The 8051 Microcontroller Architecture Programming and Applications", Penram International Publishing (India). 1996.
2) Kenneth J. Ayala., "The 8086 Microprocessor, Programming and Interfacing the PC", Penram International Publishing. 1995.
3) Barry. B. Brey. "The Intel Microprocessor 8086/8088. 80186, 80286, 80386 and 80486 Architecture Programming and Interfacing". Prentice Hall of India Pvt. Ltd. 1995.
4) Ray A.K. Bhurchandi. K.M, "Advanced Microprocessor and Peripherals", Tata McGraw, Hill, 2002.

94408 : OBJECT ORIENTED PROGRAMMING AND MODELING

AIM

- To learn and implement the basic concepts of OOPS using C++

Unit–I

Object Oriented Programming: Objects and Classes – Methods – Messages – Encapsulation – Abstraction – Inheritance – Polymorphism – Dynamic Binding. Traditional Approach versus Object Orientation: The Benefits of Object Orientation – Flexibility in Software Development – Reusability – Extensibility and Maintainability.

Unit–II

C++: Classes – Member Functions – Reference Variables – Constructor and Destructor Functions – Inline Functions – Overloaded Functions and Operators – Inheritance and Derived Classes – Streamed I/O operators – Creating Data types in C++ – Classes in Action – Data Hiding – Introducing friend function – Techniques

for Creating and Initialising Objects – Initialising and Cleaning Objects – Deriving Classes – Virtual Functions.

Unit–III

Components of C++ functions – Function Prototypes – Calling C++ Functions – Passing Arguments – Reference Arguments – Default Arguments – Inline Functions – Member Functions – Iterative Functions and Objects – Virtual Functions and Polymorphism.

Unit–IV

Function and Operator Overloading – Operator Overloading Using friend functions – Examples of Operator Overloading – Constructor and Destructor Functions – Initialising Objects – Calling Constructors – Creating Static, Dynamic and Automatic Objects – Different Types of Constructors.

Unit–V

Inheritance and Class Hierarchies Using Constructors and Destructors in Derived Classes – C++ Stream I/O Systems – Using the Stream Operators – Initialising istream, ostream Objects – Record Oriented File I/O.

Text Book

1) Bjarne Stroustrup, "The C++ Programming Language", Addison Wesley Publications, Second Edition, 1991.

References

1) Balagurusamy, E., "Object Oriented Programming in C++", TMH, Delhi, 1997.
2) Neill Graham, "Learning C++", McGraw Hill, 1991.
3) Keith Wleiskamp and Bryan Flamig, "The Complete C++ Primer", Academic Press Inc, 1990.

94508 : OPERATING SYSTEMS

AIM

- To understand the different functions of the operating system.

Unit–I : Basics of OS

Introduction – Fundamental Concepts – Overview of Operating Systems – Classes of operating systems – Batch processing systems – Multiprogramming systems – Real time operating systems – Distributed operating systems.

Unit–II : Concurrency Issues

Processes and threads – Scheduling – Preemptive and non preemptive scheduling – Real time scheduling – Disk scheduling – Disk scheduling Algorithm – Scheduling in Unix – OS/2 and windows NT – Deadlock – Prevention – Detection Avoidance and Recovery.

Unit–III : Memory management

Memory Management – Levels of Management Static and Dynamic memory allocation – contiguous and non contiguous memory allocation – Paging and segmentation – Fragmentation and compaction – swapping – overlays – virtual memory – Demand paging – Page Replacement Algorithm – Shared pages – memory mapped files.

Unit–IV : File Management – Mutual Exclusion and Synchronization

File systems – File system and IOCS – File operation – File Protection – Interface between file system and IOCS – Allocation – File access – File sharing – Security and Protection – File system of MSDOS and window NT – Mutual Exclusion and synchronization – Principles of concurrency – Mutual exclusion – Software Approaches – Hardware Support – Semaphore – Monitors – Message Passing.

Unit–V : Implementation Issues

I/O and resource management – I/O System Software – Disk Device Driver access Strategies – Modeling of disks – Unification of files and I/O devices – Generalized Disk drives – Disk caching – SCSI Device drivers – Resources in OS – Protection of resources – User authentication – Mechanism for protecting Hardware and software resources – External security.

Text Books

1) Dhamdhere, D.M., "Operating Systems, A Concept Based Approach", Tata McGraw Hill, 2nd edition, 2006.
2) Sibarshaz, Z., Peterson and Galvin, "Operating System Concepts", Addison Wesley, Third Edition, 1991.
3) William Stallings, "Operating Systems – Internals and Design Principles", Prentice Hall, Third edition 1998.

References

1) Andrew S. Tenenbaum, "Modern Operating Systems", PHI, 2nd Edition, 2001.
2) Achut S. Godbole and Kahata Atul, "Operating Systems and Systems Programming", Tata McGraw Hill, 2003.
3) Charles Crowley, "Operating Systems – A Design Oriented Approach", Tata McGraw Hill, 1999.

94608 : PRINCIPLES OF COMMUNICATION ENGINEERING

Aim

- To learn the concepts of analog digital modulation techniques and communication systems as they are the fundamentals for any types of communication.

Unit–I : Amplitude Modulation: Transmission and Reception

Principles of amplitude modulation – AM envelope – frequency spectrum and bandwidth modulation index and percent modulation – AM power distribution. AM modulator circuits – low level AM modulator – medium power AM modulator AM transmitters – low level transmitters – high level transmitters – receiver parameters AM receptions: AM receivers – TRF – superhererodyne receivers Double conversion AM receivers.

Unit–II : Angle Modulation: Transmission and Reception

Angle Modulation – FM and PM waveforms – phase deviation and modulation index – frequency deviation – phase and frequency modulators and demodulators – frequency spectrum of a angle modulated waves – Bandwidth requirement – Broadcast band FM. Average power FM and PM modulators – Direct FM and PM –

Direct FM transmitters – indirect transmitters – Angle modulation VS amplitude modulation.

FM receivers: FM demodulators – PLL FM demodulators – FM noise suppression – Frequency VS phase Modulation.

Unit–III : Digital Modulation Techniques

Introduction – Binary PSK – DPSK – Differentially encoded PSK – QPSK – M – ary PSK – QASK – Binary FSK – MSK – Duobinary encoding – performance comparison of various systems of Digital modulation

Unit–IV : Baseband Data Transmission

Sampling theorem – Quadrature sampling of band pass signals – reconstruction of message from its samples – signal distortion in sampling – Discrete PAM signals – power spectra of discrete PAM signals – ISI Nyquist Criterion for Distortion less base band binary transmission – eye pattern – base band M – ary PAM systems – adaptive equalization for data transmission..

Unit–V : Spread Spectrum and Multiple Access Techniques

Introduction – pseudo – noise sequence – DS spread spectrum with coherent binary PSK – processing gain FH spread spectrum – multiple access techniques – wireless communications – TDMA and CDMA – wireless communication systems – source coding of speech for wireless communications.

Text Books

1) Wayne Tomasi, "Electronic Communication Systems: Fundamentals Advanced". Pearson Education, 2001. (Unit–I Chapters – 3.4; Unit–II: Chapters – 6.7; Unit–III Chapters – 12)
2) Simon Haykin, Digital Communications, John Wiley & Sons, 2003 (Unit–IV Chaperts – 3,4; Unit–V Chapters – 7.8)

References

1) Simon Haykin, Communication Systems, John Wiley & Sons 4th edn., 2001.
2) Taub & Schilling, Principles of Communications Systems, TMH.2nd edn., 2003.
3) Martin S. Roden, Analog and Digital Communications System, PHI, 3rd edn., 2002.
4) Blake, Electronic Communication Systems, Thomson Delman, 2nd edn., 2002.

FIFTH SEMESTER

95108 : DATA BASE MANAGEMENT SYSTEMS

AIM

- To study about the fundamentals of database management systems, models of databases and applications.

Unit–I : Introduction

File System vs. DBMS – Views of data – Data Models – Database Languages – Database Management System Services – Overall System Architecture – Data Dictionary – Entity – Relationship (E – R) – Enhanced Entity – Relationship Model.

Unit–II : Relational Approach

Relational Model – Relational Data Structure – Relational Data Integrity – Domain Constraints – Entity Integrity – Referential Integrity – Operational

Constraints – keys – Relational Algebra – Fundamental operations – Additional Operations – SQL – Basic Structure – Set operations – Aggregate Functions – Null values – Nested Sub queries – Derived Relations – Views – Modification of the database – Joined Relations – Data Definition Language – Triggers.

Unit–III : Database Design

Functional Dependencies – Pitfalls in Relational Database Design – Decomposition – Normalization using Functional Dependencies – Normalization using Multi – valued Dependencies – Normalization using Join Dependencies – Domain – Key Normal form.

Unit–IV : Implementation Techniques

Overview of Physical Storage Media – Magnetic Disks – RAID – Tertiary storage – File Organization – Organization of Records in Files – Indexing and Hashing – Ordered Indices – B+ tree Index Files – B tree Index Files – Static Hashing – Dynamic Hashing – Query Processing Overview – Estimation of Query Processing Cost – Join strategies – Transaction Processing – Concepts and States – Implementation of Atomicity and Durability – Concurrent Executions – Serializability – Implementation of Isolation – Testing for Serializability – Concurrency control – Lock Based Protocols – Timestamp Based Protocols.

Unit–V : Current Trends

Distributed Databases – Data Storage – Network Transparency – Query processing – Transaction Model – Commit Protocols – Coordinator selection – Object Oriented Databases – Object Oriented Data Model – Object Oriented Languages – Persistent Programming languages – Persistent C++ Systems – Object relational Databases – Nested Relations – Complex types and Object Orientation – Querying with complex types – Creation of complex values and objects.

Text Book

1) Abraham Silberschatz, Henry F. Korth, S. Sudharshan, “Database System Concepts”, Fourth Edition, Tata McGraw Hill, 2002.

References

1) Ramez Elmasri, Shamkant B. Navathe, “Fundamentals of Database Systems”, Fourth Edition, Addision Wesley, 2002.
2) Raghu Ramakrishnan, “Database Management Systems”, Third Edition, McGraw Hill, 2002.
3) Peter Rob and Corlos Coronel, “Database Systems – Design, Implementation and Management,” Fifth Edition, Thompson Learning, Course Technology, 2003.

95208 : INTERNET AND JAVA PROGRAMMING

AIM

- To study about Internet, Core java. Java swing, JDBC, Java Beans and Sewlets.

Unit–I : Internet

Internet – Connecting to Internet: Telephone – Cable – Satellite connection – Choosing an ISP – Introduction to Internet Services – E – mail Concepts – Sending and Receiving secure E – mail – Voice and Video Conferencing.

Unit–II : Core Java

Introduction – Operators – Data types – Variables – Arrays – Control Statements – Methods and Classes – Inheritance – package and interface – Exception handling – Multithread programming – I/O – Java Applet – String handling – Networking – Event Handling – Introduction to AWT – AWT controls – Layout managers – Menus – Images – Graphics.

Unit–III

Java Swing: Creating a swing Applet and Application – Programming using Panes – Pluggable Look and feel – Labels – Text fields – Buttons – Toggle Buttons – Checkboxes – Radio Buttons – View Ports – Scroll Panes – Scroll Bars – List – Combo Box – Progress bars – Menus and Toolbars – Layered Panes – Tabbed Panes – Split Panes – Layouts – Windows – Dialog Boxes – Inner frame.

JDBC: The connectivity Model – JDBC/ODBC Bridge – Java.sql package – connectivity to remote database – navigating through multiple rows retrieved from a database.

Unit–IV : Java Beans

Application Builder tools – The bean developer kit(BDK) – JAR files – Introduction – Developing a simple bean – using bound properties – The java Beans API – Session Beans – Entity Beans – Introduction to Enterprise Java Beans(EJB) – Introduction to RMI(Remote Method Invocation): A simple client – server application using RMI.

Unit–V : Java Servlets

Servlet basic – Servlet API basic – Life cycle of a Servlet – Running Servlet – Debugging Servlet – Thread – safe Servlet – HTTP Redirects – Cookies – Introduction to Java server pages(JSP).

Text Books

1) Margaret Levine Young, "The Complete Reference Internet", Tata McGraw Hill 1999
2) Herbert Schidt, "The Complete Reference JAVA2", Tata McGraw Hill, 5th edition, 2002
3) Balagurusamy, E., "Programming with A Perimer 3e Java", Tata McGraw Hill, 2007.
4) Dustin R. Callway, "Inside Servlets", Addison Wesley., 1999.
5) Mark Watka "Using Java 2 Enterprise Edition", Que, 1st edition, 2001.
6) Setven Holzner, "Java2 Black Book", Coriolis Group Books, 2001.

953008 : NUMERICAL MATHEMATICS AND OPERATIONS RESEARCH

AIM

- To enable the Students to gain a wast Knowledge in numerical methods and Resource Management Techniques

Objective

- To develop the Skills of the students in method of finite differences, interpolation, Solution of algebraic equations, Solution of Simultaneous equations, Numerical Solution of Ordinary and Partial differential equations.

- To gain a Knowledge about Linear and Non – linear programming Problems, PERT and CPM.

Unit–I : Numerical Methods

Interpolation: Newton's Forward and Backward interpolation formulae – Strlings interpolation formula – Lagrange's interpolation formula for unequal intervals.

Numerical differentiation Using Newton's forward and backward formulae.

Numerical integration: Trapezoidal Rule – Simpson's one – third and three – eighth rules.

Unit–II

Solution of algebraic and Transcendental equations: Bisection method – Regula falsi method – Newton Raphson method – Groeffe's root Squaring method.

Solution of Simultaneous linear algebraic equations: Gauss elimination method – Gauss Seidel iterative method – Crout's method.

Unit–III

Numerical solution of Ordinary differential equations: Taylor's Series method – modified Euler's method – Runge – Kutta method of fourth order – Milne's Predictor – Corrector method.

Numerical solution of partial differential equations: Solution of Laplace equation – Liebmann's Process – solution of parabolic equation – Bender – Schmidt recurrence relation – Solution of Hyperbolic equation.

Unit–IV : Operation Research

Linear Programming problems – simplex method – Big – M method – Transportation and assignment problems.

Unit–V

Scheduling by PERT and CPM – Non linear programming Problems – Lagrangian method – Kuhn Tucker Conditions.

Text Books

1) Venkataraman, M.K, "Numerical Methods in Science and Engineering", The National Publishing Company, Madras, 2005.
2) Kanti Swarup, Gupta, P.K., and Manmohan, "Operations Research", S. Chand & Company, New Delhi.

References

1) Kandasamy P., K. Thilagavathy and K. Gunavathy, "Numerical Methods", S. Chand and Co(Ltd), 2005.
2) Taha, H.A., "Operation Research", Prentice Hall of India, New Delhi.
3) Sharma, S.K., "Mathemeatical Models in Operation Research", Tata McGraw Hill Publishing Company Ltd., New Delhi.

95408 : UNIX AND WINDOWS PROGRAMMING

AIM

- To learn about Windows SDK programming and Unix programming.

Unit–I

Unix operating System: Unix Philosophy – login & Password – Commands: date, who, user, list, cat, wc, exit – The file system – General purpose utilities – the Bourne shell – The vi editor.

Unit–II

Programming with the shell – Advanced features of the shell – Simple filters – advanced filters – Line editing with Examples – System administration.

Unit–III

Building a program – Types and names – Creating a main window – Event driven programming – Window messages – Displaying text Resources and projects – Menus.

Unit–IV

File common dialogue – Disk files – Text : Stock fonts – Text size – Text position – Scroll bars – Text input – Character strokes – Non-charecterstrokes.

Unit–V

The resource workshop – Invoking dialog boxes – Radio button and check boxes – List boxes and combo boxes – Displaying menu items – Menu accelerator – Icons and cursors, Graphics, Debugging.

Text Books

1) Sumithabha Das, "UNIX System v.4 Concepts and Applications", Tata McGraw Hill Publications, Third edition, 1994 [units 1 and 2].
2) Robert Lafort, "Windows Programming Made Easy", The Waite Group, Galgoita Publications (p) ltd, First edition, 1993.[units 3 – 5].

References

1) Richard Stevens, W., "Advanced Programming in the Unix Environment", Addison Wesley Publications, First Reprint, 1998.
2) Charles Petzold, "Programming Windows", Microsoft Press, Fifth Edition, 1999.
3) Yashavant Kanetkar, "Unix Shell Programming", BPB publications, 1996.
4) Brian W. Kernighan, "The Unix Programming Environment", Fourteenth Indian Reprint, 1999.
5) Marc. J. Rozhkind, "Advanced Unix Programming", Prentice Hall Software Series, 1985.
6) Tare, R.S., "Unix Utilities", McGraw Hill, First Edition, 1988.

SIXTH SEMESTER

96108 : COMPUTER GRAPHICS AND MULTIMEDIA

AIM

- To understand the concept of computer graphics and its applications.

Unit–I : Introduction

Overview of Graphics System – Bresenham technique – Line Drawing and Circle Drawing Algorithms – DDA – 2D Clipping.

Unit–II : 2D Transformations

Two dimensional transformations – Interactive Input methods – Polygons – Splines – Bezier Curves – Window view port mapping transformation.

Unit–III : 3D Transformations

3D Concepts – Projections – Parallel Projection – Perspective Projection – Visible Surface Detection Methods – Visualization and polygon rendering – Color models –

XYZ – RGB – YIQ – CMY – HSV Models – animation – Key Frame systems – General animation functions – morphing.

Unit–IV : Overview of Multimedia

Multimedia hardware & software – Components of multimedia – Text – Image – Graphics – Audio – Video – Animation – Authoring.

Unit–V : Multimedia Systems and Applications

Multimedia communication systems – Data base systems – Synchronization Issues – Presentation requirements – Applications – Video conferencing – Virtual reality – Interactive video – video on demand

Text Books

1) Hearn, D. and M.P. Baker, "Computer Graphics – C Version", 2nd Edition, Pearson Education, 2004. (UNIT–I, II and III)
2) Ralf Steinmetz, Klara Steinmetz, "Multimedia Computing, Communications and Applications", Pearson Education, 2004 (UNIT–IV & V)

References

1) Siamon J. Gibbs and Dionysios C. Tsichritzis, "Multimedia Programming", Addison Wesley, 1995.
2) John Villamil, Casanova and Leony Fernanadez, Eliar, "Multimedia Graphics", PHI, 1998.
3) William M. Newman, Robert F. Sproull, “Principles of Interactive Computer Graphics”, II Edition, McGraw Hill, 1989.
4) Steven Harrington, “Computer Graphics A Programming Approach”, McGraw Hill, 1987.

96208 : VISUAL PROGRAMMING

AIM

- To understand Windows, Visual Basic and Visual C++ programming.

Unit–I

Windows Programming: Conceptual Comparison of Traditional Programming Paradigms – Overview of Windows Programming – Event driven programming – Data Types – Windows Messages – An introduction to GDI – Dynamic Linking Libraries.

Unit–II

Visual Basic Programming: Introduction – VB environment – Customizing a Form – Data Types – Variables – Scope of Variables – Arrays – Statements in VB – Functions and Procedures – Properties – Methods and Events – Modules.

Unit–III

Toolbox Controls – Control arrays – Flex Grid Control – Dialog Boxes – Common Dialog Control – Menus – MDI Forms – Accessing database with data control – Communicating with other Windows applications – VB and the Internet.

Unit–IV

Visual C++ Programming: VC++ Components – Microsoft foundation Classes – Event Handling – Document View` architecture – Menus – Dialog Boxes – Using

VBX Controls – Using ActiveX Controls – Reading and Writing documents – SDI and MDI environments.

Unit–V

Splitter windows and Multiple views – MFC File Handling – Exception Handling – Debugging – Object Linking and Embedding – DLL – Database Management with ODBC.

Text Books

1) Charles Petzold, "Windows Programming", Microsoft Press, 1999.
2) Garry Cornell, "Visual Basic 6 from the Ground Up", TMH, 1999.
3) Steven Holzner, "Visual C++ Programming", Second Edition, PHI Publishers, 1997.

References

1) Robert Lafore, "Windows Programming Made Easy", Galgotia Publishers, 1997.
2) David Krunglinski, J., "Inside Visual C++", Microsoft Press, 1993.

96308 : DATA COMMUNICATION

AIM

- To Study the concepts and principles involved in data communication, transmission methods and networking.

Unit–I

A communications model – Data Communications – Data Communications Networking – computer communication architecture – standards. Data Transmission – Concepts and terminology – Analog and Digital Transmission – Transmission Impairments – Transmission media.

Unit–II

Data encoding – Digital data Digital signals – Digital data Analog signals – Analog signals Analog data – Analog data Analog signals – Data Communications Interface: Asynchronous and synchronous Transmission – Line configuration – Interfacing.

Unit–III

Data link control: Flow controls – Error Detection – Error Control – High Level Data Link Control (HDLC) – multiplexing – Frequency Division multiplexing – Synchronous time – Division multiplexing – Statistical time division multiplexing.

Unit–IV

Wide Area Networks: ISO – OSI layered architecture – function of the layers – Data link protocols – HDLC – LAPB – LAPD – Inter networking devices – Repeaters – bridges – routers – routing algorithms – Distance vector routing – link routing – X.25 protocol – congestion control.

Unit–V

Local Area Networks: LAN topology – Ethernet – Token bus – Token ring – FDDI – Wireless LAN – ATM LAN – IEEE 802 Medium access control layer standard – Random access protocols – ALOHA – Slotted ALOHA.

Text Books

1) William Stallings, "Data and Computer Communications", Fifth Edition, Prentice Hall of India, 1997.
2) Forouzan, "Introduction to Data Communication & Networking", McGraw Hill, 1998.
3) Achyut S. Godbole, Atul Kahate, "Computer Communication Network", Tata McGraw Hill, New Delhi, 2004.

References

1) Ulysess D. "Black Data Communication and Distributed Networks", Third Edition, Prentice Hall of India, 1977.
2) Prakash C. Gupta, "Data Communications", Prentice Hall of India, 1996.
3) Andrew. S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2002.
4) Stallings, W., "Data and Computer Communication", Second Edition, New York, McMillian, 1988.

96408 : DIGITAL SIGNAL PROCESSING

Aim

- To learn the basic concepts of signal processing. These concepts are the basics for image processing and other signal processing applications.

Unit–I

Discrete time signals: Definition – examples – classification – operation on signals.

Discrete time systems: Definition – examples – classification

Z – Transform: Definition – Z transform of finite duration sequences and infinite duration sequences with ROC – properties – Inverse Z transform – problems.

Unit–II

Discrete Fourier Transform: Definition and its properties. Fast Fourier Transform [FFT]: Direct computation of DFT – Divide and conquer approach of DFT – Radix – 2 FFT algorithm: Decimation in Time [D.I.T] and Decimation in frequency [D.I.F] algorithms, IDFT using FFT algorithms.

Unit–III

Infinite impulse response (IIR) filters: Introduction – Basic IIR digital filter structures – Design of IIR filters from analog filters – Frequency transformation – Design of IIR filters using impulse invariant technique – Bilinear transformation.

Unit–IV

Finite impulse response (FIR) filters: Introduction – Basic FIR digital filter structures – Design of FIR filters using window methods – Frequency sampling method.

Unit–V

Multirate Digital Signal Processing: Introduction – Decimation – Interpolation – Sampling rate conversion. Applications: Interfacing of digital systems with different

sampling rates – Speech processing – Sub band coding of speech signals – Over sampling A/D and D/A conversion.

Text Books

1) Sanjit K. Mitra, "Digital Signal Processing – A Computer Based Approach", Tata McGraw Hill Edition, 2002.
2) Ramesh Babu, P., "Digital Signal Processing", Third Edition, Scitech Publications India Pvt. Ltd. 2006.

References

1) Salivahanan, S., A. Vallavaraj and C. Gnanapriya, "Digital Signal Processing", Tata Mc Graw Hill.
2) John G. Proakis and Dimitris G. Manolakis, "Digital Signal Processing Principles,Algorithms and Applications, 3rd edition, Prentice Hall of India Pvt., Ltd., 2002.
3) Alan Oppenheim V., Ronald Schafer W., "Discrete Time Signal Processing", Pearson Education India Pvt. Ltd., New Delhi, 2002.

SEVENTH SEMESTER

97108 : PRINCIPLES OF MANAGEMENT

AIM

- To understand the functions of management giving an intensified focus and marketing management.

Unit–I : Forms of Business Organizations

Sole proprietorship, Company – Public and private sector enterprises – Principles of management – Evolution of management – Functions of a manager.

Unit–II : Functions of Management

Planning – Nature and purpose – Types of plans – Objectives, policies, procedures, rules, strategies, programmes, projects.

Unit–III : Staffing

Selection – Recruitment process – Decision making process – Types of decisions – Directing – Leadership – Motivation – Communication – Controlling – process, techniques – Budgetary and Non – budgetary.

Unit–IV : Financial Management

Short term and long term sources of funds – Financing decision – Investment decision – Introduction to financial statements – Production management – Planning and scheduling, purchasing, inventory control.

Unit–V : Marketing Management

Introduction to marketing mix – product, pricing, promotion and place – Personnel management – Performance appraisal, conflict – Identification and resolution – Training and development – Introduction to Total Quality Managment, quality circles.

Text Book

1) Koontz, "Global Prespective in Management, McGraw Hill, 1995.

References

1) Nauhria R.N. and Rajnish Prakash, "Management and Systems", Wheeler Publishing, New Delhi, 1995.
2) Saxena, "Marketing Management", Tata McGraw Hill, 1998.
3) Tripathi, "Principles of Management", Tata McGraw Hill, 1992.

97208 : COMPUTER NETWORKS

Aim

- To study the hardware, software and various protocols involved in data communication using computer networks

Unit–I

Introduction: The uses of computer networks – Network hardware – Network software – Reference models – Example of networks – Network standardization.

The Physical Layer: The theoretical basis for data communication – Guided Transmission media – Wireless transmission – PSTN – Mobile telephone – Communication satellite.

Unit–II

The Data Link Layer: Data link layer design issues – Error detection and correction – Elementary data link protocols – Sliding window protocols – Example of data link protocols – ETHERNET – 802.11, 802.16, Bluetooth – Data link layer Switching.

Unit–III

The Network Layer: Network layer design issues – Routing algorithms – Congestion control algorithms – Internetworking – Network layer in Internet. Network Services BOOTP and DHCP – Domain Name Service – WINS – Web Serving and Surfing Web servers – Web clients (browsers).

Unit–IV

The Transport Layer: Transport layer design issues – Transport protocols – Simple transport protocol – Internet transport protocols UDP, TCP.

Unit–V

The Application Layer: Domain Name System – Electronic mail – World Wide Web – Multimedia – Cryptography, Digital signature – Communication Security.

Text Book

1) Andrew S. Tanenbaum, “Computer Networks”, PHI, 4th edition, 2002.

References

1) William Stallings,” Data and Computer Communications”, PHI, 2001
2) Douglas E. Comer,” Internetworking with TCP/IP – Volume–I”, PHI, 1997.

97308 : SOFTWARE ENGINEERING

Aim

- The subject aims to impart sound knowledge to design and implement an efficient software system and manage the resources.

Unit–I : Software Engineering Fundamentals

The system engineering process – Software process models – Process iteration – Software Specification – Software design and implementation – Software validation –

Software Evolution – Project management activities – Project planning – Project scheduling – Risk management – Software requirements – Functional and non – functional requirements – User requirements – System requirements – software requirements document.

Unit–II: Requirements Engineering Processes

Feasibility studies – Requirements elicitation and analysis – Requirements validation – Requirements management – System Models – Context – Behavioral – Data and Object models – CASE workbenches – Software prototyping – Prototyping in the software process – Rapid prototyping techniques – User interface prototyping – Formal Specification – Formal specification in the software process – Interface specification – Behavioral specification

Unit–III : Architectural Design

System structuring – Control models – Modular decomposition – Domain – specific architectures – Overview of design for Distributed systems – Object – oriented and Real – time software – Design with Reuse – Component – based development – Application families – Design patterns – User interface design – User interface design principles – User interaction – Information presentation – User support – Interface evaluation.

Unit–IV : Critical Systems

Overview of Dependability – System Specification – and System Development – Verification and validation – Planning – Software inspections – Automated static analysis – Cleanroom software development – Software testing – Defect testing – Integration testing – Object – oriented testing – Critical systems validation – Formal methods and critical systems – Reliability validation – Safety assurance – Security assessment.

Unit–V : Industry Standards

Overview of Managing software people – Software cost estimation – Productivity – Estimation techniques – Algorithmic cost modelling – Project duration and staffing – Overview of Quality management and Process Improvement – Overview of Legacy Systems – Software change and re – engineering – Configuration management – planning and managing change – version and release – Overview of SEI – CMM – ISO 9000 and Six Sigma – Over view of CASE tools.

Text Book

1) Ian Sommerville, "Software Engineering", Addison, Wesley, 2004.

Reference

2) Roger S. Pressman, "Software Engineering", McGraw Hill, 2004.

97408 : INFORMATION CODING TECHNIQUES

Aim

- To learn about elements of information theory, coding and compression techniques various error control codes and encryption algorithms.

Unit–I

Information Entropy Fundamentals: Uncertainty, Information and Entropy – Source coding Theorem – Huffman coding – Shannon Fano coding – Discrete

Memory less channels – channel capacity – channel coding theorem – Channel capacity theorem.

Unit–II

Data and Voice Coding: Delta Modulation, adaptive Delta Modulation – Coding speech at low bit rates – Adaptive differential Pulse code Modulation – sub – band coding. Audio and Video Coding: Linear predictive coding – code excited LPC – Perceptual coding, MPEG audio coders – Dolby audio coders.

Unit–III

Compression Techniques: Principles – Text compression – Static Huffman Coding – Dynamic Huffman coding – Arithmetic coding – Image Compression – Graphics Interchange format – Tagged Image File Format – Digitized documents – Introduction to JPEG standard., – Video compression – Principles – Introduction to H.261and MPEGV standards**.**

Unit–IV

Error Control Coding: Linear Block codes – Syndrome Decoding – Minimum distance consideration – cyclic codes – Generator Polynomial – Parity check polynomial – Encoder for cyclic codes – calculation of syndrome – Convolutional codes.

Unit–V

Encryption Coding: Transposition and Substitution coding – Data Encryption Standards (DES) – Key distribution problem – public key encryption – public key decryption and MIT algorithm – Direct sequence CDMA based encryption – orthogonal sequences – R – Scodes.

Text Books

1) Simon Haykin, “Communication Systems”. John Wiley & Sons, 4th edition, 2001.
2) Fred Halsall, “Multimedia Communications, Applications Networks Protocols & Standards”, Pearson education, Asia 2002; Chapters:3,4,5.
3) Viterbi, “Information Theorey and Coding”, McGraw Hill, 1982.
4) Proakis, “Digital Communication”, McGraw Hill, 1994.
5) “Data Compression Book”, BPB Publication, 1992.

References

1) Proakis, “Digital Communication”, McGraw Hill, 1982.
2) Mark Nelson, “Data Compression Book”, BPB Publication, 1992.
3) Watkinson, J., “Compression in Video and Audio”, Focal Press, London, 1995.

EIGHTH SEMESTER

98108 : TELECOMMUNICATION SWITCHING AND NETWORKS

Aim

- To understand switching systems and their functions, types, signalling, transmission and data networks.

Unit–I : Evaluation of Public Switched Telecommunication Network

Switching system functions – Stronger switching system – Cross bar exchange – SPC exchange – Message switching – Circuits switching – Telephone handset – Four

wire concept – Hybrid circuit – Echo suppressor and chancellors – PCM coders – Modems and relays – Telecommunication standard.

Unit–II : Digital Switching Systems

Time switching – Space switching – STS and TST switching – Digital switching system hardware – Principles of switching system software – Organizational processing software – Switching in networked environment – ISDN.

Unit–III : Signalling and Traffic

Channel associated signalling – Common channel signalling – SS7 protocol – Traffic – Grade of service – Modelling switching system – Blocking models and relay system.

Unit–IV : Transmission Networks

Subscriber loop – DSL – ADSL – FDM and TDM – PCM multiplex group – PDSH, SDH / SONET – Cross talk – Line equalizations – Adaptive equalizers – Single stage network – Two, three, four stage networks – Network synchronization.

Unit–V : Data Networks

Data transmission in PSTN – Packet switching – Connection oriented and connectionless protocols – ISO – OSI architecture – TCP/IP and Internet – Multiple access techniques – Satellite based data networks – Principles of ATM networks.

Text Books

1) Flood, J.E., "Telecommunication Switching, Traffic and Networks", Pearson Education Ltd, New Delhi, 2001.
2) Syed R. Ali, "Digital Switching Systems", McGraw Hill, New York, 1998.

References

1) Viswanathan, T., "Telecommunication Switching Systems and Networks", PHI, 1994.

98208 : ETHICS IN ENGINEERING

Unit–I

Introduction to Engineering Ethics – Senses of "Engineering Ethics" – Variety of Moral Issues – Three Types of Inquiry – Engineering Ethics and Philosophy.

Need for Engineering Ethics – Moral Dilemmas – Moral Autonomy – Kohlber's Theory – Gilligan's Theory – Consensus and Controversy.

Professions and Professionalism – Professions – Membership Criteria – Persuasive Definitions – Multiple Motives.

Model Reasoning and Ethical Theories – Theories about Virtues – Professional Responsibility – Integrity – Self – Respect – Senses of "responsibility"

Theories about Right Action – Utilitarianism – Duty Ethics – Rights Ethics – Testing Ethical Theories –

Self – Interest, Customs, and Religion – Self – Interest and Ethical Egosim – customs and Ethical Relativism – Religion and Divine Command Ethics.

Uses of Ethical theories – Resolving Moral Dilemmas – Justifying Moral Obligations – Relating Professional and Ordinary Morality.

Unit–II

Engineering as Social Experimentation – Engineering As Experimentation – Similarities to Standard Experiments – Learning from the past – Contracts with Standard Experiments – Knowledge Gained.

Engineering as Responsible Experimenters – Conscientiousness – Relevant Information – Moral Autonomy – Accountability.

The Challenger Case – Safety issues.

Codes of Ethics – Roles of Codes – Codes and the Experimental Nature of Engineering – Limitations on codes.

A balanced outlook on law – A regulated Society – The trend toward Greater Detail – Industrial Standards – Problems with the Law in Engineering – The Proper Role of Law in Engineering.

Safety and Risk – The concept of Safety – Risks – Acceptability of Risk – Lessons for the Engineer.

Assessment of Safety and Risk – Knowledge of Risk – Uncertainties in Design – Testing for Safety – When Testing is inappropriate.

Risk – Benefit analyses and reducing risk – Personal risk – Public risk and public acceptance – accounting publicly for benefits and risks – incentives to reduce risk – some examples of improved safety – liability.

Three Mile island Chernobyl and safe exits – Three Mile Island – Prior warnings – Chernobyl – Three Mile Island, Chernobyl, and a Forerunner – Safe Exit.

Unit–III

Responsibilities to Employers – Collegiality and Loyalty – Collegiality – Two Senses of Loyalty – Obligations of Loyalty – Misguided Loyalty – Professionalism and Loyalty.

Respect for Authority – Institutional Authority – Morally Justified Authority – Accepting Authority – Paramount Obligations.

Collective Bargaining – Historical Note – Faithful Agent Argument – Public Service Argument – Conclusion.

Confidentiality – Definition – Justification and Limits – Changing Jobs – Management Policies.

Conflicts of Interest – Impairment of Judgment and Service – Gifts and Bribes – Interests in Other Companies – Insider Information – Moral Status.

Occupational Crime – Industrial Espionage – Price Fixing – Endangering Lives.

Unit–IV

Issues – Professional Rights – Basic Right of Professional Conscience – Institutional Recognition of Rights – Specific Rights: Recognition and Conscientious Refusal – Foundation of Professional Rights.

Whistle – Blowing – Definition – Three Cases – Moral Guidelines – Protecting Whistle – Blowers – Commonsense Procedures – The right to Whistle – Blow – Beyond Whistle – Blowing.

The Bart Case – Background – Responsibility and Experimentation – Controversy – Aftermath – Comments.

Employee Rights – Employee Bill of Rights – Choice of Outside Activities – privacy – Drug Testing – Due process.

Discrimination – Examples – Definitions – Antidiscrimination Laws – Moral Justification of Nondiscrimination Laws – preferential Treatment – Sexual Harassment.

Multinational Corporations – Three Senses of "Relative" Values – "When in Rome" – International Rights – Promoting Morally Just Measures – Technology Transfer and Appropriate Technology – Bhopal.

Environmental Ethics – Case Studies – The Commons and a Livable Environment – Guilty until Proven Innocent? – Internalizing Costs of Environmental Degradation – Technology Assessment – Philosophical.

View of Nature.

Computer Ethics – Power Relationships – Property – privacy – Professional Issues.

Weapons Development – The Weapons Seesaw – The Engineer's Involvement in Weapons Work – Defense Industry Problems – Decommissioning Weapons and Lasting Effects.

Unit–V

Engineers as Managers, Consultants and Leaders – Engineers as Managers Managers as Professional – Promoting and Ethical Climate – Managing Conflict.

Consulting Engineers – Advertising – Competitive Bidding – Contingency Fees – Safety and Client needs – Provision for resolution of Disputes.

Engineers as Expert witness and Advisers – Experts Witnesses in the courts – Abuses – Advisers in Planning and Policy – making – Normative Models of Advisers.

Moral Leadership – Morally Creative Leaders – Participation in Professional Societies Leadership in Communities – Ideals of Voluntary Service.

Concluding Remarks. Integrity and Ingenuity – Citicorp Skyscraper.

Reference Books

1) Mike W. Martin Roland Schinzinger, "Ethics in Engineering – Third Edition", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2003.

98308 : NETWORK SECURITY

Aim

- To expose the threats to network security, different encryption/decryption techniques.

Unit–I : Symmetric Ciphers

Classical Encryption Techniques – Block Ciphers and the Data Encryption Standard – Introduction to Finite Fields – Advanced Encryption Standard – Symmetric Ciphers – Confidentiality using Symmetric Encryption.

Unit–II : Public Key Encryption and Hash Functions

Introduction to Number Theory – Public Key Cryptography and RSA – Key Management, other Public Key Cryptosystem – Message Authentication and Hash Functions – Hash and MAC Algorithms – Digital Signatures and Authentication Protocols.

Unit–III : Program Security

Secure Programs – NonMalicious Program Errors – Viruses and Others Malicious Code – Targeted Malicious Code – Control Against Threats.

Unit–IV : Database Security

Introduction to Database – Security Requirement – Reliability and Integrity – Sensitive Data – Inference – Multilevel Databases – Multilevel Security.

Unit–V : Network Security

Networks Concepts – Threats in Networks – Network Security Controls – Firewalls – Electronic Mail Security – IP Security – Web Security.

Text Books

1) Charles B. Pfleeger, Shari Lawrence Pfleeger, “Security in Computing”, Third Edition, Pearson Education, 2003.
2) William Stallings, “Cryptography and Network Security – Principles and Practices”, Pearson Education, Fourth Edition, 2003.

Rererences

1) Atul Kahate, “Cryptography and Network Security, Tata McGraw Hill, 2003.
2) Stewart S. Miller, “Wi-FI Security”, McGraw Hill, 2003.
3) Bruce Schneier, “Applied Cryptography”, John Wiley & Sons Inc., 2001.

98708 : PROJECT WORK AND VIVA – VOCE

The topic for project work will be assigned by the Head of the Department of Computer Science and Engineering.

The project work should be taken during the VII Semester and the final report submitted by the students on a date fixed by the Head of the Department towards the end of the VIII Semester. There will be viva – voce examination on project.

ELECTIVES

9XX08A : C# AND .NET PROGRAMMING

AIM

- To study about the .NET Framework, C# Basics, Libraries and advanced features of C#.

Unit–I : .NET Framework

Introduction – Common Language Runtime – Common type system – Common language specification – The base class library – the NET class Library intermediate language – Just – in – time compilation – garbage collection – application installation and assemblies – web services – unified classes.

Unit–II : C# Basics

Introduction – Data types – Identifiers – Variable & constants – C# statements – Object Oriented Concepts – Object and classes – Arrays and Strings – System collections – Delegates and Events – Indexes Attributes – Versioning.

Unit–III : C# Using Libraries

Namespace – System – Input Output – Multi – Threading – Networking and Sockets – Data Handling – Windows forms – C# in web application – Error Handling.

Unit–IV : Advanced Features Using C#

Web Services – Windows services – messaging – Reflection – COM and C# – Localization.

Unit–V : Advanced Features Using C#

Distributed application in C# – XML and C# – Unsafe Mode – Graphical Device Interface with C# – Case Study (Messenger Application).

Text Book

1) Shildt, “C#: The Complete Reference”, Tata McGraw Hill, 2002.

References

1) Shibi Panikkar and Kumar Sanjeev, “Magic of C# with NET Frame Work”, Firewall Media, 2005.
2) Jeffrey Richter, “Applied Microsoft Net Framework Programming”, Microsoft Press, 2002.
3) Fergal Grimes, “Microsoft Net for Programmers”, Manning Publication, 2002.
4) Tony Baer, Jan D. Narkiewicz, Kent Tegels, Chandu Thota, Neil Whitlow, “Understanding the Net Framework”, Wrox Press, 2002.
5) Balagurusamy, “Programming with C#”, Tata McGraw Hill, 2002.

9XX08B : IMAGE PROCESSING

Aim

- To learn the basic concept of image processing and its applications.

Unit–I

Digital Image Processing Systems**:** Introduction – Structure of human eye – Image formation in the human eye – Brightness adaptation and discrimination –

Image sensing and acquisition – Storage – Processing – Communication – Display. Image sampling and quantization – Basic relationships between pixels

Unit–II

Image Enhancement in the Spatial Domain: Gray level transformations – Histogram processing – Arithmetic and logic operations – Spatial filtering: Introduction – Smoothing and sharpening filters

Image Enhancement in the Frequency Domain: Frequency domain filters: Smoothing and Sharpening filters – Homomorphic filtering

Unit–III

Wavelets and Multiresolution Processing: Image pyramids – Subband coding – Haar transform – Series expansion – Scaling functions – Wavelet functions – Discrete wavelet transforms in one dimensions – Fast wavelet transform – Wavelet transforms in two dimensions

Unit–IV

Image Data Compression: Fundamentals – Redundancies: Coding – Interpixel – Psycho – visual – Fidelity criteria – Image compression models – Error free compression – Lossy compression – Image compression standards: Binary image and Continuous tone still image compression standards – Video compression standards.

Unit–V

Morphological Image Processing: Introduction – Dilation – Erosion – Opening – Closing – Hit – or – Miss transformation – Morphological algorithm operations on binary images – Morphological algorithm operations on gray – scale images

Image Segmentation: Detection of discontinuities – Edge linking and Boundary detection – Thresholding – Region based segmentation

Image Representation and Description: Representation schemes – Boundary descriptors – Regional descriptors

Text Books

1) Gonsalez, R.C., and R.E. Woods**, "**Digital Image Processing", Second Edition, Pearson Education, 2002.
2) Anil K. Jain, "Fundamentals of Image Processing", PHI, New Delhi, 2001.

References

1) William Pratt, "Digital Image Processing", John Wiley.

9XX08C : DATA WAREHOUSING AND MINING

Aim

- To learn about how to retrive information using the concept of data mining in different fields like marketing, ethics and database.This course also aim in learning about data warehouse architecture, operations, security, service, testing of datawarehouses etc.

Unit–I : Data Mining

Introduction – Information and production factor – Data mining vs. Query tools – Data and machine learning – Machine learning and statistics – Data Mining in

marketing – Data Mining and ethics – Nuggets and data mining – Database Mining – A performance and database Perspective – Self learning computer systems – Concept learning – Data mining and the Data Warehousing –

Unit–II : Knowledge Discovery Process

Knowledge discovery process – Data selection – Cleaning – Enrichment – Coding – Preliminary analysis of the data set using traditional query tools – Visualization techniques – Knowledge representation – Decision trees – Classification rules – Association rules – Rules with exceptions – rules involving relations – Trees for numeric – Instance – based representation – Neural Networks – Genetic Algorithms – Clustering – KDD (Knowledge Discovery in Databases) Environment.

Unit–III : Dataware House – Architecture

Data warehouse Architecture – System Process – Process Architecture – Design – Database Schema – Partitioning Strategy – Aggregations – Data Marting – Meta Data – System and Data Warehouse Process Managers.

Unit–IV : Hardware and Operational Design

Hardware and operational design of Data Warehouse – Hardware Architecture – Physical Layout – Security – Backup and Recovery – Service – Level Agreement – Operating the Warehouse.

Unit–V : Planning – Tuning and Testing

Capacity planning – Tuning the Data Warehouse – Testing Warehouses – Data Warehouse Features.

References

1) Pieter Adriaans, Dolf zantinge, "Data Mining", Pearson Education, 2007.
2) Ian H. Witten & Eibe Frank, "Data Mining – Practical Machine Learning Tools and Techniques, Morgan Kaufmann Publishers, 2006
3) Sam Anahory, Dennis Murray, "Data Warehousing in the Real world – A Practical Guide for Building Decision Support Systems", Pearson Education, 2006.
4) Jiawei Han, Micheline Kamber, "Data Mining: Concepts and Techniques", Morgan Kaufmann Publishers, 2000.

9XX08D : SPEECH PROCESSING

Aim

- To learn the basic concepts of speech production, analysis, coding, recognition and synthesis.

Unit–I : Speech Production

Speech production mechanism – articulatory phonetics – acoustic phonetics – acoustic theory of speech production – vocal tract models for speech analysis and synthesis – coarticulation – prosody. Speech perception: Perception mechanism – sound perception.

Unit–II : Speech Analysis

Short – time speech analysis – time – domain parameters – frequency – domain parameters – linear prediction analysis – cepstral analysis – other spectral estimation methods – pitch extraction.

Unit–III : Speech Coding

Introduction – quantization – speech quality measure – time – domain waveform coding – linear predictive coding – spectral coders – vocoders – vector quantization coders. Speech Enhancement: Introduction – speech enhancement techniques – spectral subtraction – filtering and adaptive noise cancellation.

Unit–IV : Speech Recognition

Introduction – dynamic time warping – hidden Markov model – language models – artificial neural network – expert – system approach to automatic speech recognition.

Unit–V : Speech Synthesis

Introduction – principles of speech synthesis – synthesizer methods. Speaker Recognition: Introduction – recognition techniques.

Text Book

1) O'Shaughnessy, D., "Speech Communications, Human and Machine", Second Edition, University Press (India), 2001.

References

1) Rabiner, L.R. and R.W. Schafer, "Digital Processing of Speech Signals", Pearson Education, 2005.
2) Rabiner, L. and B.H. Juang, "Fundamentals of Speech Recognition", Pearson Education, 2003.

9XX08E : SATELLITE COMMUNICATION AND BROAD CASTING

Aim

- To understand the basics of satellite analysis and design, access and services of satellite communication and broadcasting.

Unit–I : Satellite Fundamentals

Satellite construction – Satellite Orbit – orbital mechanics – Equation of orbit – Orbital Elements – Look angle determination – Limits of visibility – Sub satellite point – Sun transit outage – Space craft technology – Altitude in orbit control – Populsion telemetry – Tracking and command – Communication and antenna subsystems – Launching procedures – Launch vehicles.

Unit–II : Link Design

Basic transmission theory – Satellite uplink and down link – Analysis and design – Link budget – Performance impairments – System noise – Inter modulation interference – Propagation characteristics and frequency considerations – System reliability – Design of life time – Earth station design.

Unit–III : Satellite Access

Introduction – Preassigned FDMA – Spade system – TDMA concept – Reference burst – Preamble and Postamble – Carrier Recovery – Network synchronization – Satellite – Switched TDMA – Code Division Multiple Access – Direct sequence spread spectrum – Spectrum spreading and dispreading – CDMA throughput.

Unit–IV : Satellite Services

Introduction – Orbital spacings – Transponder capacity – Bitrates for digital television – Satellite Mobile services – VSATs – Radarsat – Global positioning satellite systems – Orbcomm.

Unit–V : Broadcasting

TV Standards – PAL, NTSC, Broardcost satellite characteristics – Review of uplinking system – Receivers – Direct to home – Community antenna television system – Digital audio broadcasting – Satellite radio receivers – CD audio – bandwidth requirement – Example satellite system – INSAT,ASIASTAR – applications.

Text Books

1) Roddy, D., "Satellite Communication", McGraw Hill, 1996.
2) Tri T. Ha, "Digital Satellite Communication Systems", McGraw Hill.

References

1) Pratt and Bostian, "Satellite Communication Systems Engineering", PHI, 1986.
2) Agarwal, B.N., "Design of Geo Synchronous Space Craft", Prentice Hall, 1986.
3) Robert M. Gagliendi, "Satellite Communication", John Wiley and Sons, 1988.
4) Pritchend and Sciulli, "Satellite Communication Systems Engineering", PHI, 1986.

9XX08F : ENTERPRISE RESOURCE PLANNING

Aim

- To study basic concept of enterprise resource planning model advantage and Architecture.

Unit–I : Introduction to ERP

Integrated Management Information System – Seamless Integration – Supply Chain Management – Integrated Data Model – Benefits of ERP – Business Engineering and ERP – Definition of Business Engineering – Principle of Business Engineering – Business Engineering with Information Technology.

Unit–II : Business Modelling for ERP

Building the Business Model – ERP Implementation – An Overview – Role of Consultant – Vendors and Users – Customisation – Precautions – ERP Post Implementation Options – ERP Implementation Technology – Guidelines for ERP Implementation.

Unit–III : ERP and the Competitive Advantage

ERP domain MFG/PRO – IFS/Avalon – Industrial and Financial Systems – Baan IV SAP – Market Dynamics and Dynamic Strategy.

Unit–IV : Commercial ERP Package

Description – Multi – Tier Client/Server Solutions – Open Technology – User Interface – Application Integration.

Unit–V : Architecture

Basic Architectural Concepts – The System Central Interfaces – Services – Presentation Interface – Database Interface.

Text Books

1) Vinod Kumar Garg and N.K. Venkita Krishnan, "Enterprise Resource Planning – Concepts and Practice", PHI, 2003.
2) Jose Antonio Fernandz, The SAP R/3 Handbook, TMH, 2006.

9XX08G : PARALLEL ALGORITHMS

Aim

- To learn about different parallel computer models and to study about different parallel algorithms designed for this parallel model. These parallel algorithms are compared with sequential algorithms for their time complexity.

Unit–I : Introduction to Parallel Computing

Supercomputers Modern Parallel Computers – Data Parallelism – Functional Parallelism – Pipelining and Data Clustering – Performance Analysis: Introduction – Speedup – Superlinear Speedup and Efficiency – Amdahl's Law.

Unit–II : Model of Serial computation – Parallel Computational Models

PRAM – CRCW – CREW – EREW – Simulating CRCW on CREW & EREW – PRAM algorithms Processor organisations: Tree – Mesh – Linear Array – Ring – Star – Hypercube – Cube – connected – cycles – Perfect shuffle network – Butterfly – Pyramid.

Unit–III : Sorting

Sorting on a linear array – Sorting on a mesh – Sorting on EREW SIMD computer – MIMD enumeration sort – MIMD quick sort – Sorting on other networks.

Unit–IV : Matrix Operations

Mesh transpose – Shuffle transpose – EREW transpose – Mesh multiplication – Cube multiplication – Matrix by vector multiplication – Tree multiplication.

Unit–V : Numerical Problems

Linear equations – SIMD algorithm – Roots of nonlinear equations – MIMD algorithm – Partial differential equations – Computing Eigen values.

Text Books

1) Michael J. Quinn, "Designing Efficient Algorithms for Parallel Computers", University of New Hampshire, McGraw Hill Book Company, 1987.
2) Michael J. Quinn, "Parallel Computing Theory and Practice" McGraw Hill, Second Edition, 1994

Reference

1) Akl, S.G., "The Design and Analysis of Parallel Algorithms", Prentice Hall of India, 1989.

9XX08H : CLIENT SERVER COMPUTING

Aim

- To study about client/server computing and its characteristics. Role of the client – and server Components, Type of server Network.

Unit–I : Introduction

Client Server computing and its Characteristics – Client Server Architecture – Benefits of Client Server Computing – Hardware Trends – Software Trends – Components of Client Server Applications – Classes of Client Server Applications – Categories of Client Server Applications.

Unit–II : The Client

Role of the Client – Client Components – Client Services – Client Operating Systems – GUI – GUI Environments – GUI Design Standards – Open GUI Standards – Database Access and Tools – Interface Independence – Testing Interfaces – Development Aids.

Unit–III : The Server

Role of the Server – Server Functionality in Detail – Features of Server Machines – Classes of Server Machines – Layers of Software – Network Management Environment – Network Computing Environment – Server Operating System – Transaction Processing – Connectivity – Intelligent Database – Stored Procedures – Triggers – Load Leveling – Optimizer – Testing and Diagnostic Tools – Reliability – Backup and Recovery Mechanisms – Data Management Software.

Unit–IV : The Network

Layers – Interfaces and Protocols – Standard Architectures – Network Characteristics – Network Management Standards – LAN Characteristics – LAN Hardware – Network Operating Systems.

Unit–V : Development Methodology and Tools

Convert Existing Screen Interfaces – Reengineering Existing Applications – Business Re-Engineering – Methodology Tools – EASEL Workbench – Ellipse – SQL Windows Power Builder – SQL Toolset – Future of Client Server Computing.

Text Book

1) Dewire and Dawna Travis," Client/ Server Computing", McGraw Hill, 1993.

References

1) Patric Smith and Steve Guengerich", Client/Server Computing", Second Edition, PHI, 1997.
2) Robert Orfali, Dan Harley, Jeri Edward", The Essential of Client/Server Survival Guide", Second Edition, Galgotia, 1997.

9XX08I : E – COMMERCE

Aim

- To study the basic concepts of E – Commerce network infrastructure – information publishing technology security and search engine services.

Unit–I

Introduction to E-Commerce: Benefits – Impacts – Classification and Application of E-Commerce – Business Model – Architectural Frame Work.

Unit–II

Network Infrastructure: Local Area Network – Ethernet – Wide Area Network – Internet – TCP/IP Reference Model – Domain Name System – Internet Industry structure – Information Distribution and Messaging: FTP Application – Electronic Mail – World Wide Web Server – HTTP – Web Server Implementations.

Unit–III

Information Publishing Technology: Information Publishing – Web Browsers – HTML – CGI – Multimedia Content – Other Multimedia Objects – VRML – Securing

the Business on Internet – Why Information on Internet is Vulnerable? – Security Policy – Procedures and Practices – Site Security – Protecting the Network – Firewalls – Securing the Web Service

Unit–IV

Securing Network Transaction – Electronic Payment Systems: Introduction – Online Payment Systems – Pre – paid Electronic Payment System – Post – paid Electronic Payment System – Requirement Metrics of a Payment System

Unit–V

Search Engines and Directory Services: Information Directories – Search Engines – Internet Adverting – Agents in Electronic Commerce: Needs and Types of Agents – Agent Technologies – Agents Standards and Protocols – Agents Applications – Case Study.

Text Book

1) Bharat Bhasker, 'Electronic Commerce Framework Technologies and Applications', Tata McGraw Hill Publication, 2003.

References

1) Ravi Kalakota and Andrew B. Whinston, "Frontiers of Electronic Commerce", Pearson Education Asia, 1999.(Chapters 1,2,3,6 – 10,16)
2) Marilyn Greenstein and Todd M. Feinman, "Electronic commerce: Security, Risk Management and Control " Tata McGraw Hill, 2000.(Chapters 7,8,10– 12)

9XX08J : NATURAL LANGUAGE PROCESSING

Aim

- To understand the concepts of natural language Processing: Language related algorithms and techniques, Computational morphology and Phonology, passing and semantic interpretation

Unit–I : Introduction

Speech and Language Processing – Ambiguity – Models and algorithms – Language – Thought – Understanding – Brief history – Regular Expressions – Automata – Morphology and Finite State Transducers – Computational Phonology and Text-to-Speech.

Unit–II : Probabilistic Models and Speech Recognition

Spelling – Bayesian method – Weighted Automata – N – grams – Smoothing – Entropy – HMMs and Speech Recognition – Speech Recognition Architecture – Hidden Markov models – Decoding – Acoustic processing – Speech recognizer – Speech synthesis.

Unit–III : Syntax

Word classes and Part-of-Speech Tagging – Tag sets – Transformation based tagging – Context free rules and trees – The noun phrase – Co-ordination – Verb phrase – Finite state and context free grammars – Parsing with context free grammars.

Unit–IV : Unification and Probalistic Parsing

Features – Implementing unification – Unification constraints – Probabilistic context free grammars – Problems – Lexicalized context free grammars – Dependency grammars – Human parsing – Language and Complexity.

Unit–V : Semantics

Representing meaning – First order predicate calculus – Semantic analysis – Attachments – Idioms – Compositionality – Robust semantic analysis – Lexical semantics – Selectional restrictions – Machine learning approaches – Dictionary based approaches – Information retrieval.

Text Book

1) Daniel Jurafsky and James H. Martin, "Speech and Language Processing", Pearson Education, 2002.

References

1) Miechael W. Berry, "Survey of Text Mining: Clustering, Classification and Retrieval Systems", Springer Verlilag, 2003.
2) James Allen, "Natural Language Understanding", Benjamin Cummings Publishing Co., 1995.

9XX08K : PERVASIVE COMPUTING

Aim

- To study concepts of pervasive computing, design and security of pervasive computing.

Unit–I : Architecture

Relationship of Wireless Computing – ubiquitous – internet Computing. Related ideas: Ambient Computing. Elements of Pervasive architecture. Requirements of computational infrastructure. Failure management. General issues: Security – performance – dependability. Web architectures. Local networks. Store and forward.

Unit–II : Devices Technology

Device and network technologies. Devices categories. Devices characteristic Heterogeneity and Interoperability. Mobile Agents. device management. Language localization issues for mobile device – User Interface design issues for mobile devices – Difference between UI design for mobile devices and conventional systems.

Unit–III : Sensor Networks and RFIDS

Introduction to Sensor networks. Types of sensor networks. Berkeley Motes. Sensor network organization. Sensor network routing mechanisms . Platforms for Wireless sensor networks – Sensor Node Architecture – Sensor Network Architecture.

Unit–IV : Local Area and Wide Area Wireless Technologies

Local area wireless networks. IEEE 802.11 technologies. Mobile IP. Infrared technologies. Bluetooth networks (OBEX Protocol). Messaging Systems. Personal Area Networks. Network Management. Quality of service. Wireless protocols. Establishing wide area wireless networks: Concept and structure of cell.

Unit–V : Protocols and Application

Protocols: Networking protocols. packet switched protocols. Routing Protocols for sensor Networks. Data Centric Protocols. Hierarchical Protocols. Location – based protocols. Multimedia Messaging Service (MMS) Protocols. Wireless Application Protocol (WAP).Application Mobile access to patient information in a hospital – sales support – retailing – service support – tracking applications – Designing for small screen devices – Search interfaces – Context – awareness – Determining "locality".

Text Book

1) Uwe Hansman, Lothar Merk, Martin S. Nicklous & Thomas Stober, "Principles of Mobile Computing", Second Edition, Springer, Verlag, New Delhi, 2003.

References

1) Rahul Banerjee, Internetworking Technologies: An Engineering Perspective, Prentice, Hall of India, New Delhi, 2003.
2) Rahul Banerjee, Lecture Notes in Pervasive Computing, Online Notes, BITS, Pilani, 2007.
3) Yi, Bing Lin & Imrich Chlamtac, Wireless and Mobile Network Architectures, John Wiley & Sons, New Delhi, 2004.

9XX08L : NEURAL NETWORKS AND FUZZY SYSTEMS

AIM

- To learn basic concepts of neuron, different types of neural networks, application of neural networks, fuzzy logic operations and its applications.

Unit–I

Introduction – neural networks characteristics – terminologies – model of a neuron. Types of learning: Supervised – Unsupervised learning. Perceptron: Architecture of a Perceptron – Perceptron convergence algorithm. Linearly separable and Inseparable problems – Generalized delta rule. Backpropagation (BP) Training Algorithm – Learning Rate – Training Considerations – Characteristics of BP Learning Algorithm – Limitations of BP Learning – Accelerated convergence of BP through learning – rate adaptation.

Unit–II

Unsupervised Learning: Hebbian Learning – Competitive Learning – Boltzmann Learning. Supervised Learning: Error – Correction learning – Reinforcement Learning. Recurrent Network: Basic Concepts of Hopfield Network – Operation Features of Hopfield Network – Error Performance of Hopfield Network – Storage Capacity of Hopfield Network.

Unit–III

Radial basis function neural networks (RBFNN) – Basic learning laws in Radial basis function nets – Counter propagation networks – Adaptive resonance theory networks – Autoassociative neural networks (AANN) – Applications of neural networks such as pattern recognition – Optimization – Associative memories – speech and decision – making.

Unit–IV

Fuzzy Logic **–** Basic concepts of Fuzzy Logic – Fuzzy set versus Crisp Set – Linguistic variables – membership functions – operations of fuzzy sets – Fuzzy If – Then rules – fuzzy relations – fuzzy conditional statements – fuzzy rules – fuzzy learning algorithms – applications of fuzzy logic.

Unit–V

Neuro – fuzzy and fuzzy – neural control systems – adaptive fuzzy systems – optimizing the membership functions and the rule base of fuzzy logic controllers using neural networks – fuzzy transfer functions in neural networks.

Text Books

1) Haykin, S., "Neural Networks: A Comprehensive Foundation", 2nd Ed, Prentice Hall, 1999.
2) Timothy J. Ross, "Fuzzy Logic Engineering Applications", McGraw Hill, New York, 1997.

References

1) Wasserman P.D, "Neural Computing Theory and Practice," Van Nostrand Reinhold, New York, 1997.
2) Riza C Berkin and Trubatch, "Fuzzy systems Design Principles", Building a Fuzzy IF,THEN Rule Bases, IEEE Press ISBN 0 – 7803 – 1151 – 5.
3) Kosko, B, "Neural Networks and Fuzzy Systems: A Dynamical Approach to Machine Intelligence", Prentice Hall, New Delhi, 1991.

9XX08M : THEORY OF COMPUTATION

AIM

- To learn different types of grammars and their automatons.

Unit–I

Regular expression – Properties – Construction of deterministic and non – deterministic finite automata – Minimization of finite automata – Equivalence of finite automata and regular expressions – Construction of Finite automata from the regular expression – Construction of Moore and Mealy machines – Equivalence of Moore and Mealy machines. Regular set: Pumping lemma – Properties – Decision algorithms.

Unit–II

Context Free Grammar (CFG): Derivation – Parse tree – Ambiguity – Chomsky Normal Form – Greibach Normal Form. Push Down Automata (PDA): Definition – Construction of PDA from the language – Construction of PDA from the CFG. Equivalence of PDA and Context Free Language (CFL) – Pumping lemma for CFL – Properties – Decision algorithms.

Unit–III

Turing Machine(TM): Basic model – Construction of TM – Modifications of Turing Machine – Church's hypothesis – Restricted TM equivalent to the basic model.

Unit–IV

Undecidability : Decidable and Undecidable problems – Properties of recursive and recursively enumerable languages – Universal TM – Halting Problem – Rice's Theorem and its application – Undecidability of Post's correspondence problem – Applications.

Unit–V

Chomsky hierarchy: Regular Grammar (RG) – Right Linear and Left Linear Grammar – Equivalence of RG and Finite automata. – Unrestricted Grammar(URG) – Equivalence of URG and TM – Context Sensitive Grammar(CSG) – Construction of Linear Bounded Automata (LBA) – Equivalence of CSG and LBA – Comparison of grammars and their associated automaton – Applications.

Text Book

1) John E. Hopcraft and J.D. Ullaman, "Introduction to Automata Theory, Languages and Computation", Narosa Publishing House, 1997.

Reference

1) Martin, "Introduction to Languages and Theory of Computation", TMH, 1998.

9XX08N : MAINFRAME SOFTWARES

Aim

- To study the concepts of mainframe, structure command and file control.

Unit–I

MVS Overview – MVS Characteristics Program Development – System Initialization – Job Management – Storage Management – Data Management – Input/Output Management – Termination and Recovery – DASD – Volume Organization.

Unit–II

TSO/ISPF: TSO Commands – General Syntax of JCL Statements – JES (Job Entry System) – JCL Explanation of Job Statements – Explanation of EXEC Statements – Explanation of DD Statements – Additional Parameters on JOB – EXEC – DD Statements – IBM Utilities – Procedures – Procedures Overriding Parameters – Symbolic Parameters.

Unit–III

VSAM: VSAM data set Organization Structure – VSAM in Application Programming – Internal Organization – IDCAMS Comments – JCL for VSAM – Buffering – Alternative index – Repro – Backup and Recovery – Export and Import – KSDS – ESDS – RRDS – LDS.

DB2: Introduction to DBMS – RDBMS – Codd's Rule – Normalization Introduction to XDB – Data Base Design – SQL – Relationship – DB2 Objects – Locks – Program Preparation – Cursor – Null Indicators – Optimer – Utilities.

Unit–IV

CICS: CICS Introduction – Role of CICS – CICS Operations – CICS Components – CICS Services – CICS Tables – EIP/EIB – CICS – Terminal Control – BMS map – Map Definition Macros – Map I/O Operations – Screen Definition Facility – Program

Control – Application House Keeping – Exec – Interface block – Supplied Transactions – CESN – CESF – CEMT – CEDF – NMDS – BMS – Abend Codes – File Control – Program Control – TSQ – TDQ – Pseudo Conversation – LINK Command – XCTL – Recovery and Rollback.

Unit–V

File Control – Write Command – Browsing – Delete – Unlock – Accessing Relational Database – Temporary Storage Queue – TD – I/O – Dynamic Transaction Backout – CICS Supplied Transaction – Exception Handling in CICS.

Text Books

1) Yukihisa Kargeyama", CICS Hand Book", Tata McGraw Hill, 1997.
2) Craig S. Mullins", DB2 (3rd Edition) – Developers Guide", Techmedia, SAMS Publishing, 1998.
3) Brown, "JCL Job Control Language", John Wiley, 1999.
4) Chander Rande, "JCL", McGraw Hill, 1994.
5) Doug Lowe, "MVS", Mike Murach Associates, 1994.

9XX08O : WEB TECHNOLOGY

AIM

- To Study about Web environment, HTML, XML, Java Script and JSP.

Unit–I : Web Environment

WWW – HTTP – Web Server and its deployment – N – Tier Arch. – Services of Web Server – Mail server – News server – Proxy server – Multimedia server –

Unit–II : HTML

Formatting – tags – links – list – tables – frames – forms – comments in HTML.

Unit–III : XML

Introduction – displaying an XML Document – Data interchange with an XML Document – Document type definition – Parsers using XML – Client – side usage – Server – side Usage.

Unit–IV : Java Script

Introduction – Documents – forms – Statements – Functions – Objects in Java scripts – events and event handling – arrays – FORMS – Buttons – Checkboxes – Text fields and text areas.

Unit–V : JSP

JSP overview – JSP language basics – JSP translation and compilation directives – Standard java objects from JSP – JSP configuration and deployment – actions and tags of JSP; Java servlets – Arch – servlet interface – applications of servlets.

Text Books

1) Phil Hanna, "Instant Java Servlets", Tata McGraw Hill, 2000.
2) William B. Brogden, Bill Brogden, Chris Minnick, "Java Developer's Guide to E – Commerce with XML and JSP", Sybex Book, 2001.
3) Stephen Walther and Others, "Active Server Pages Unleashed", Wrox Press Ltd, 1998.

4) Linecker, “COM+ & XML: ASP.N on the Edge”, John bailey and Sons Unlimited Edition, 2001.
5) Burdman, “Collaborative Web Development”, Addison Wesley, 1999.
6) Sharma & Sharma, “Developing E – Commerce Sites”, Addison Wesley, 2000.
7) Ivan Bayross, “Web Technologies Part II”, BPB Publications, McGraw Hill, 2004.
8) Shishir Gundavarma, “CGI Programming on the World Wide Web”, O'Reilly & Associate, 1996.
9) DON Box, “Essential COM”, Addison Wesley, 1998.
10) Greg Buczek, “ASP Developer's Guide”, Tata McGraw Hill, 2000.

9XX08P : MOBILE COMPUTING

Aim

- To study the concepts of mobile computing including access control, digital mobile phone systems, wireless LAN and the needed protocols.

Unit–I

Introduction to wireless communication – Wireless data technologies – Frequencies for radio signals – antennas and signal propagation – need and types of multiplexing techniques – modulation types – use of spread spectrum – cellular Systems.

Unit–II

Medium Access Control: Need for MAC algorithm – medium access methods and comparison of these methods

Unit–III

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

Unit–IV

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

Unit–V

Protocols for mobile computing: mobile network layer – mobile IP – Snooping TCP – Mobile TCP – Fast and selective retransmission and recovery – Transaction oriented TCP. Wireless Application Protocol. WAP architecture wireless datagram protocol – transport layer security – WML – script.

Text Books

1) Jachen Schiller, “Mobile Communications”, Addison, Wesley, 2000.
2) Asoke K. Talukder, Roopa R. Yavgal, “Mobile Computing”, TMH Publishing, 2005.

References

1) Reza B, "Far, "Mobile Computing Principles", Designing and Developing Mobile Application with UML and XML", Cambridge University Press, 2005.
2) William C.Y. Lee, "Mobile Communication Design Fundamentals", John Wiley, 1993.

9XX08Q : COMPILER DESIGN

Aim

- This course aims to learn all the principles involved in designing a compiler.

Unit–I

Compiler – phases of compiler – compiler construction tools – bootstrapping – Lexical Analysis: Role of Lexical analyzer – input buffering – specification of tokens – recoginition of tokens – construction of NFA – DFA and minimal DFA from regular expression – Lexical analyzer – Lex programs – Implementation of a Lexical analyser.

Unit–II

Review of context free grammars – Derivation and parse tree – Ambiguity in CFG. syntax analyzer**:** Design of Parsers: Shift Reduce parser – Operator Precedence Parser – Predictive Parser – LR parser – SLR parser – LALR parser. An automatic parser generation – YACC.

Unit–III

Syntax directed translation (SDT) schemes – SDT scheme for desk calculator – parse tree with translation – Intermediate code – postfix notation – three address code – quadruples – triples – translation scheme for assignment statements – translation scheme for boolean expression – control flow method scheme for if – then else – do statements – translation with top down parser – SDT schemes for procedure call – declaration – case statements – structure declaration. Symbol Table**:** Contents of table – data structures for symbol table – representing scope information.

Unit–IV

Implementation of simple stack allocation schemes – implementation of block structured languages. error detection and recovery – : reporting errors – sources of errors – syntactic error – semantic error – panic mode of recovery in YACC.

Unit–V

Introduction to code optimization – principle sources of optimization – loop optimization – basic blocks – flow graphs – loop unrolling – loop jamming – The DAG representation of basic blocks – application of DAGs – global data flow analysis – use definition chaining – reaching definitions – data flow equations.

Code generation: object program – problems in code generation – a simple code generation register allocation and assignment – Peep hole optimisation.

Text Books

1) Alfred V. Aho, Ravi Sethi & Jeffrey. D. Ullman, "Compilers Principles, Techniques & Tools", Addison – Wesley, 1988.
2) Dhamdhere, D.M., "Compiler Construction – Principles and Practuce", Tata McGraw Hill, 2000.

References

1) Alfred V. Aho, Jeffrey D. Ullman, "Principle of Compiler Design", Narosa Publishing House, 1990.
2) Muchnik, S.S., "Advanced Compiler Design Implementation", Morgan Kaufman Publishers, 1977.
3) Allen I. Holub, "Compiler Design Implementation", Morgan Kaufman Publisher, 1997.
4) Kenneth C. Lou den, "Compiler Construction, Principle and Practice", Thomson Books, 1997.

9XX08R : HIGH SPEED NETWORKS

Aim

- To know about the Knowledge of high speed networks such as high speed LANS, ISDN, ATM and ABR Traffic Management.

Unit–I

High Speed LANS: Synchronous Digital Hierarchy(SDH), Fibre Optic Network, Synchronous Optical Network(SONET) standards – Performance of High speed LAN – throughput, delay and reliability – Wave length division multiplexed (WDM) LAN – Fast Ethernet, wireless LAN, Gigabit LAN.

Unit–II

ISDN and Standards: Overview of ISDN – User interface, architecture and standards – Packet switched call over ISDN – B and D channels – Link Access procedure(LAP) – ISDN layered architecture, signaling – Limitations of Narrow band ISDN(N – ISDN) and evolution of Broad band ISDN(B – ISDN).

Unit–III

A Synchronous Transfer Mode Networks: ATM protocol architecture – ATM Adaption layer – synchronous fast packet switching techniques and VP/VC encapsulation. ATM cells – ATM cell header interpretation – Source characteristics.

Unit–IV

ATM Traffic and Congestion Control: ATM attributes – Qos parameters – Congestion control – Connection management, policing and reactive control principles – Discrete time queue analysis and application to Connection Admission Control (CAC) – Peak Cell rate algorithm – Leaky Bucket algorithm.

Unit–V

ABR Traffic management: Rate control – cell flow – capacity allocation – Explict Rate feedback Schemes – GFR Traffic management – PCR, MCR, MBS, MFS and CDVT.

Text Books

1) Stallings, W., "High Speed Networks and Internet", Pearson ed., 1999.
2) Onvural, R.O., "ATM Networks – Performance Issues", Artech House, 1995.
3) Stallings, W., "High Speed Networks, TCP/IP and ATM Design Principle", PHI, 1998.

References

1) Craig Patridge, "Gigabit Networking", Addision Wesley, 1977.
2) Stallings, W., "ISDN – BISDN with Frame Relay and ATM", PHI, 2000.

9XX08S : ADVANCED WIRELESS COMMUNICATION

Aim

- To study the principles involved in Advanced Wireless Communication system like Cellular Concept mobile Propagation, modulation and Access Techniques

Unit–I : Introduction

Brief history of wireless communication – elements of wireless communication systems – examples of wireless communication systems – radio frequency spectrum and bandwidth requirements – Universal Mobile Communication Systems – Personal Communication systems – emerging trends in wireless communications Wireless systems and standards: AMPS and ATACS systems – 2G – 2.5G 3G and B3G systems and standards – emergence of 4G standards

Unit–II : Cellular Concept

Frequency Reuse – Channel Assignment and Handoff Strategies – Interference and System Capacity – Trunking and Grade of Service – Improving Coverage and Capacity Incellular Systems – Radio wave Propagation – Free Space Propagation Model – Basic Propagation Mechanisms – Reflection – Ground Reflection Model – Diffraction – Scattering – Practical Link Budget Design – Outdoor and Indoor Propagation Models – Signal Penetration Into Buildings – Ray Tracing and Site Specific Model.

Unit–III : Mobile Radio Propagation

Small Scale Multi path Propagation – Impulse Response Model of A Multi Path Signal – Parameters of Mobile Multi Path Channels – Types of Small Scale Fading – Statistical For Multi Path Channels – Multi Path Shape Factors For Small Scale Fading Wireless Channels.

Unit–IV : Modulation Technique for Mobile Radio

Amplitude Modulation – Angle Modulation – Digital Modulation – Line Coding – Pulse Shaping Techniques – Geometric Representation of Modulation Signals – Linear Modulation Techniques – Constant Envelope Modulation – Combined Linear and Constant Modulation Techniques – Spread Spectrum Modulation – Modulation Performance in Fading and Multi Path Channels.

Unit–V : Multiple Access Techniques

Fundamentals of Equalization – Training a Generic Adaptive Equalizer – Equalizers in Communication Receiver – Linear Equalizer Non Linear Equalization – Algorithm for Adaptive Equalization – Fractional Equalizer – Diversity Techniques – Rake Receiver – Interleaving Frequency Division Multiple Access (FDMA), Spread Spectrum Multiple Access – Space Division Multiple Access (SDMA) – Packet Radio.

Text Books

1) Rappaport, T.S., “Wireless Communications Principles and Practices”, Second Edition, Pearson Education, Asia, 2002
2) John G. Proakis, “Digital Communication”, McGraw Hill International, Fourth Edition, 2000.

References

1) Simon Haykin, Communication Systems, Third Edition, John Wiley, 2002.
2) Edware Lee and David Messerschmitt, Digital Communication, Kluwer, Academic Publications, 1993.

9XX08T : SOFTWARE PROJECT MANAGEMENT

Aim

- To study about software process project estimation, project scheduling, and uality standards.

Unit–I : Defining a Software Development Process

Identify the Software Model – Activities – and Relationship among Activities – document Information on each Activity – Tailoring – improving the process – Discipline need for implementing discipline – Attributes of successful leader. Communicating in Harmony – Personality Traits – Management Tools.

Unit–II : Software Project Estimation – Software

Metrics – Measuring Software – Software project estimation – Decomposition techniques – empirical estimation models – COCOMO – PUTNAM estimation model – Automated estimation tools – Planning – Risk analysis

Software estimation – Empirical estimation models – Planning – Risk analysis –

Unit–III : Software Project Scheduling

Project Management – Resource Management – Organizational Form and Structure – Software Development Dependencies – Brain Storming – Scheduling Fundamentals – PERT and CPM – Leveling Resource Assignments – Map the schedule to a Real Calendar – Critical chain scheduling. Project Tracking: Overview of Project progress – Project outlook – Occurrence of tracking – tracking meetings ground rules Recovery plans – The role of Escalations.

Unit–IV : Requirements Engineering Specification Languages

ER Languages – PSL/PSA – SREM – SADT – RSL/REVS – SSA – GIST – Formal specification techniques: Relational and State Oriented Notations.

Software configuration management: Basic functions – Responsibilities – Standards – Configuration Audit.

Unit–V : Quality Considerations and Standards

Planning For Quality – Quality improvement teams – Quality recognition – ISO 9000 – ISO 9001 Standards.

Text Books

1) Neal Whitten, “Managing Software Development Projects, Formula for Success”, John Wiley & Sons, Inc., 1995.
2) Robert T. Futrell, Donald F. Shafex, Linda I. Safer, “Quality Software Project Management “, Pearson Education, Asia, 2002.
3) Edward Yourdon, “Modern Structured Analysis”, Prentice Hall Inc., 1989.
4) Pressman R.S., “Software Engineering, A Practioner’s Approach”, Tata McGraw Hill Book Company, 1977.
5) Pankaj Jalote, “Software Project Management in Practice”, Addison Wesley, 2002.

References

1) Hughes, “Software Project Management, 3/E”, Tata McGraw Hill, 2004.
2) Walts Humphrey, “Managing the Software Process”, Addison Wesley, 1989.
3) Richard Fairley, “Software Engineering Concepts”, McGraw Hill Book Company, 1985.

9XX08U : TCP/IP NETWORK COMPONENTS

AIM

- To know about practical implementation of ISO – OSI model as TCP/IP Protocol suite and its Component protocols.

Unit–I : Standards, Standard Organisations and OSI Model

ISO – ITU(T) – ANSI – IEEE – EI Internet standards – Maturity Levels – Requirement Levels Internet Administration – ISOC – IAB – IETF – IRTF – IANA – ICANN – NIC.

Layers in the OSI Model – Physical Layer – Data link Layer – Network Layer – Transport Layer – Session Layer – Presentation Layer – Application Layer.

TCP/IP Protocol suite – Physical and Data Link Layer – Network Layer – Transport Layer – Application Layer.

Unit–II : Addressing, Connecting Devices and Routing

Addressing – Physical Address – Logical Address – Port Address. – IP Address – Address Space – Classful Addressing – Sub netting – Subnet Mask – Super netting.

Types of Address – Unicast, Multicast, Broadcast, Loopback address and anycast Address – Connecting devices – Repeaters – Hubs / Concentrators – Bridges – Routers – Gateways – Routing – Forwarding Techniques – Routing Techniques – Structure of a router.

Unit–III : Network Layer Components

IPv4 Header Format – IPV4 Options Field – IPV4 Flags – IPV4 Fragmentation.

IPV6 Header Format – IPV6 Extension Headers. – ICMP Message Format – Types of Messages – query – Checksum Calculation.

IGMP Message Format – IGMP Operation – Group Management – Encapsulation.

Unit–IV : Transport Layer Components

Process to Process communication – User Datagram Protocol Format – Checksum – UDP Operation. – TCP Services – TCP format – TCP features – TCP Connection – State transition diagram – Flow control – Error control – Congestion control – TCP timers – TCP options.

Unit–V : DNS and Network Management SNMP

DNS – Name space – Domain name space – Distribution of name space – DNS in the Internet – Resolution – DNS message Headers – Types of Records.

Network Management – SNMP – Managers and agents – Role of SNMP – Role of SMI – Role of MIB – SMI – MIB – SNMP PDU's – SNMP Format

Text Book

1) Benrouz. A. Forouzan, "TCP/IP Protocol Suite", TMH, Third Edition, 2006.

References

1) Richard Sterens, W. and G. Gabrani, "TCP/IP Illustrated, Volume 1, The Protocols", Pearson Education, 2006.
2) Douglas E. Corner, "Internetworking with TCP/IP, Volume I, Principles, Protocols and Architecture", PHI, 5th edition, 2006.

9XX08V : DISTRIBUTED OBJECTS – COM/DCOM

Aim

- To know about fundamentals to programming in distributed objects using Microsoft's COM/DCOM architecture.

Unit–I

Fundamental programming architecture and IUNKNOWN – ICLASSFACTORY.

From OLE to DCOM – parallel processing – advantages of distributed computing – building distributed systems – COM background – three faces of COM – componentware – COM interfaces – types of components – the COM library – COM as a foundation – activex on COM.

The interface definition language – the component's client – the component – COM reuse mechanisms.

Unit–II

Type libraries, language integration, threading models and apartments.

Type libraries – C++ client utilizing type library – active template library – COM programming in visual basic – COM programming in java.

Threads – apartments – apartment interactions – implementing multithreaded components – the ten threading commandments.

COM facilities – automation and component categories – the Idispatch interface – building an automation client in C++ – building an automation client in visual basic – building an automation client in VBScript – scriptlets : building COM objects in HTML – error handling – component categories.

Unit–III

Connection points, type information, monikers and structured storage.

A simple version of a connectable object – a complete implementation of a connectable object – type information.

Initializing objects – monikers – the class moniker – the java monitor – the running object table – structured storage.

Remoting architecture – DLL surrogates – marshaling – executable components.

Unit–IV

Standard vs custom marshaling, the IDL and security

Marshalling interface pointers – standard marshaling – handler marshaling – custom marshalling – converting marshaled interface pointers to strings.

IDL types – directional attributes – arrays – pointers – interface design recommendations.

Security models – declarative security: the registry – programmatic security.

Unit–V

The network protocol, MTS and COM+

Spying on the network protocol – calling all remote objects – marshaled interface pointers – the OXID resolver – DCOM garbage collection – channel hooks.

Three – tier atchitecture – MTS – OLE, network OLE, COM, activeX, DCOM, COM+.

Text Books

1) Guy Eddon and Henry Eddon, “Inside distributed COM”, WP, Microsoft Press, 1998.
2) Dale Rogerson, “Inside COM, Microsoft Component Object Model”, WP, Microsoft Press, 1998
3) Andrew S. Tanenbaum, “Distributed OS”, Prentice Hall, First Edition, 1995.

References

1) Coulouris, G., J. Dollimore and T. Kinelberg, “Distributed Systems Concepts and Design”, Third Edition, Addison – Wesley, 2001.
2) Andrew S. Tanenbaum, “Modern OS”, Prentice Hall, Second Edition, 2001.
3) Marten Van Steen and Andrew S. Tanenbaum, “Distributed Systems”, Prentice Hall, First Edition, 2001.

9XX08W : DISTRIBUTED COMPUTING

Aim

- To understand the configurations that makes up the distributed model and concepts.

Unit–I : Introduction

Distributed Processing : Models for Distributed Computing – Load Balancing – Remote Procedure Calls – Process Migration – Concurrency Issues on Databases, Hardware Concepts – Bus Based Multiprocessors – Switched Multiprocessors – Software Concepts – Network Operating Systems And NFS – Time Distributed Systems – Multiprocessor Time Sharing System – Design Issues – Transparency – Flexibility – Reliability – Performance And Scalability.

Unit–II : Communications

Communications in Distributed Systems – The Client – Server Model – Blocking Vs Non Blocking Primitives – Buffered Versus Unbuffered Primitives – Implementation of Client – Server Model.

Unit–III : Synchronization

Synchronization in Distributed Systems – Clock Synchronization – Mutual Exclusion – Election Algorithms – Atomic Transactions – Deadlocks in Distributed Systems – Threads – Thread Usage and Implementation of Thread Packages – Processor Allocation.

Unit–IV : Distributed File Systems

File Service Interface – Semantics of Sharing – Distributed File Systems.

Unit–V : Software Concepts

Distributed Programming Languages – Issues – Applications – Review of Distributed Databases.

Text Books

1) Mukesh Singal and N.G. Shivaratri, “Advanced Concepts in Operating System”, McGraw Hill, New York, 1994.
2) Pradeep K. Sinha, "Distributed Operating Systems Concepts and Design", PHI, 1998.

References

1) Paul, M. and H.J. Sugart, “Distributed Systems, Methods and Tools for Specification – An Advanced Course”, Springer Verlag, 1985.
2) Tanenbaum, A.S., "Modern Operating Systems", PHI, 1997.

9XX08X : UNIFIED MODELING LANGUAGE

AIM: The aim of this course is to provide the necessary knowledge for modeling object oriented software systems. It provides a strong and formal foundation in object-oriented analysis and design. It teaches the underlying principles of object-oriented analysis and design, including documentation of the design using UML and an UML-enabled CASE tool.

Unit–I

Why We Model: The Importance of Modeling – Principles of Modeling – Object Oriented Modeling: Introducing the UML: Overview of the UML – A Conceptual Model of the UML – Architecture – Software Development Life Cycle – Key Abstraction – Mechanism – Components. Classes: Modeling the vocabulary of a system – Modeling the Distributions of responsibilities in a system – Modeling System – Modeling primitive types. Relationships; Modeling Simple Dependencies – Modeling single Inheritance – Modeling Structural Relationships. Command Mechanism: Modeling New Building Blocks – Modeling comments – Modeling New Semantics – Modeling new properties – Diagrams: Modeling different Views of a System – Modeling Different Levels of Abstractions – Modeling Complex Views. Class Diagrams: Modeling Simple Collaborations – modeling a logical database schema – forward and reverse engineering.

Unit–II

Advanced structural classes: advanced classes: modeling the semantics of a class. Advanced relationships – modeling webs of relationships. Interface, types, and roles: modeling the seams in a system – modeling static and dynamic types. Packages: modeling A group of elements – modeling architectural views. Instances: modeling concrete Instances – modeling prototypical instances. Object Diagram: modeling Object structures – Forward and Reverse Engineering.

Unit–III

Basic Behavioral Modeling: Interactions: Modeling a flow of control. Use cases: modeling the behavior of an element. Use case diagram: modeling a context of a system modeling the requirements of system. Interaction diagram: modeling flows of control by time ordering – modeling flows of control by organization. Activity diagram: modeling a workflow – Modeling an Operation.

Unit–IV

Advanced behavioral modeling: events and signals: Modeling a family of signals – modeling exceptions. State machines: modeling the lifetime of an object. Process and threads: modeling multiple techniques – modeling Inter Process communication. Time and Space: modeling timing constraints – modeling the

distribution of objects – modeling objects that migrate. State chart Diagrams: modeling reactive objects.

Unit–V

Architectural Modeling: Components: modeling executables and libraries – modeling tables, files and documents – modeling an API – modeling source code. Deployment: modeling processors and devices – modeling the distribution of components collaborations: modeling the realization of use case – modeling the realization of an operation – modeling a mechanism. Patterns and frameworks: modeling design patterns – modeling architectural patterns.

Components diagrams: modeling source code – modeling an executable release – modeling a physical database – modeling adaptable systems. Deployment diagrams: modeling as embedded system – modeling a Client/server system – modeling a fully distribution system. Systems and models: modeling The architecture of a system – modeling systems of systems.

Text Book

1) Grady Booch, James Rumbaugh, Ivar Jacobsan, "The Unified Modeling Language User Guide", Pearson Edition Asia, Seventh Indian Reprint 2002.

9XX08Y : JSP AND EJB

AIM: The aim of this course is to provide the complete skills on Internet programming paradigm. This includes the programming knowledge about J2EE such as JSP and EJB.

Unit–I

Introduction – J2EE – JSP basics – Elements – Directives – Scripting Elements – Web Application Server Architecture – Important Servlet API Features – JSP & Java beans – introduction – Java beans – JDBC – Sample Application.

JSP Session – Persistent Connections – Cookies & Java Sessions in Action – Sessions, HTTPS and SSL

Unit–II

Error Handling & Debugging – JSP Error Handling – Types- JSP Specific

Exception Classes – Debugging – Handling different types of errors – Debugging Techniques.

Database Connectivity – RDBMS – Driver Types Creation of my SQL Database – Coding with JSP & JDBC Multiple users and connection pooling.

Unit–III

Tag Extensions and Libraries – Need – Simple Tags – Implementation of Body tag interface – Dynamic GUI – Introduction – Creation of Web Sites – Co- Branded Model. Web portal.

Unit–IV

Introduction – Transaction Process – Benefits and Models of Transaction – Two – Tier Architecture/Three - tier Architecture – Server – Side Component Architecture – Distributed Transaction Processing – The Java 2 Platform, Enterprise Edition – Enterprise Bean – Types of Bean – Logical Architecture – EJBs – Design and Implementation of a bean

Unit–V

Session Beans – Enterprise Bean Class – Life Cycle – Stateful Session Bean Example – Stateless Session Bean Example – session Contexts – EJB Security.

Entity Beans – Persistence Concept – Definition of an Entity Beans – Features of Entity Beans – Developing and using Entity Beans – Entity Contexts – Life cycle of Entity Beans – Container – managed Persistence – Bean – Managed Persistence – Debugging Problems.

Text Books

1) Karl Avedal, Danny Ayers et al, "Professional JSP", Worx Press, May 2000 ISBN – 81-7366-211-8
2) Simon Brown, Robert Burdick, Danko Cokor, et al, "Professional JSP", Wrox Press, Paperback, May 2001, ISBN 1861004958
3) Richard Monson-Haefel, "Enterprise Java Beans", O' Reilly, Shroffr Publishers & Distributors Pvt. Ltd, Mumbai, January 2001, ISBN-81-7366-2701-3.

Reference

1) Wrox Author Team, "Professional EJB", WROX Press July 2001. ISBN 1861005083.

LABORATORIES

The experiments for the various laboratory courses for the B.E (Information Technology) programme will generally follow the theory subjects concerned, taking into account the needs of the course, the needs of the time and the technological advances.

The list of experiments will be prepared by the Head of the Department from time to time.

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