AFFILIATED INSTITUTIONS

ANNA UNIVERSITY, CHENNAI

REGULATIONS – 2009

CURRICULAM AND SYLLABI

M.Sc. COMPUTER TECHNOLOGY (5 YEARS)

SEMESTER I

Course Code	Course Title	L	T	P	C
Theory					
EEN011	Technical English I	4	0	0	4
EMA006	Applied Mathematics I	3	1	0	4
ECT011	Digital Principles	3	0	0	3
ECT012	Computer Concepts and Problem Solving	3	0	0	3
ECT013	Programming in C	3	1	0	4
Practical					
ECT015	Digital Lab	0	0	3	2
ECT016	Computer Concepts and Problem Solving Lab	0	0	3	2
ECT017	C Programming Lab	0	0	3	2
	Total Credits	**16**	**2**	**9**	**24**

SEMESTER II

Course Code	Course Title	L	T	P	C
Theory					
EEN021	Technical English II	4	0	0	4
EMA007	Applied Mathematics II	3	1	0	4
ECT021	Microprocessors	3	0	0	3
ECT022	Basics of Electrical Engineering	3	0	0	3
ECT023	Data Structures	3	0	0	3
Practical					
ECT025	Microprocessors Lab	0	0	3	2
ECT026	Electrical Engineering Lab	0	0	3	2
ECT027	Data Structures Lab	0	0	3	2
	Total Credits	**16**	**1**	**9**	**23**

SEMESTER III

Course Code	Course Title	L	T	P	C
Theory					
EMA008	Mathematical Structures	3	1	0	4
ECT031	Object Oriented Programming	3	0	0	3
ECT032	Computer Architecture	3	0	0	3
ECT033	Database Management Systems	3	0	0	3
ECT034	Algorithms Design Techniques	3	0	0	3
Practical					
ECT036	Object Oriented Programming Lab	0	0	3	2
ECT037	Database Management Systems Lab	0	0	3	2
ECT038	Algorithms Lab	0	0	3	2
	Total Credits	**15**	**1**	**9**	**22**

SEMESTER IV

Course Code	Course Title	L	T	P	C
Theory					
EMA010	Operations Research	3	1	0	4
ECT041	Operating Systems	3	0	0	3
ECT042	Internet Programming	3	0	0	3
ECT043	Software Engineering	3	0	0	3
	Elective – I	3	0	0	3
Practical					
ECT045	Operating Systems Lab	0	0	3	2
ECT046	Internet Programming Lab	0	0	3	2
ECT047	Software Engineering Lab	0	0	3	2
	Total Credits	**15**	**1**	**9**	**22**

SEMESTER V

Course Code	Course Title	L	T	P	C
Theory					
ECT051	Computer Networks	3	0	0	3
ECT052	Computer Graphics	3	0	0	3
ECT053	Multimedia Systems	3	0	0	3
	Elective – II	3	0	0	3
	Elective – III	3	0	0	3
Practical					
ECT055	Networks Lab	0	0	3	2
ECT056	Computer Graphics Lab	0	0	3	2
ECT057	Multimedia Systems Lab	0	0	3	2
	Total Credits	**15**	**0**	**9**	**21**

SEMESTER VI

Course Code	Course Title	L	T	P	C
Theory					
ECT061	Principles of Management	3	0	0	3
ECT062	Network Security	3	0	0	3
ECT063	Compiler Design	3	0	0	3
ECT064	Artificial Intelligence	3	0	0	3
	Elective - IV	3	0	0	3
Practical					
ECT066	Network Security Lab	0	0	3	2
ECT067	Compiler Design Lab	0	0	3	2
	Total Credits	**15**	**0**	**6**	**19**

SEMESTER – VII

Course Code	Course Title	L	T	P	C
ECT071	Project Work - I	0	0	24	12
	Total Credits	**0**	**0**	**24**	**12**

SEMESTER VIII

Course Code	Course Title	L	T	P	C
Theory					
ECT081	TCP / IP Design and Implementation	3	0	0	3
ECT082	XML and Web Services	3	0	0	3
ECT083	C# and .net Framework	3	0	0	3
	Elective – V	3	0	0	3
	Elective – VI	3	0	0	3
Practical					
ECT085	TCP/IP Lab	0	0	3	2
ECT086	C# and .net Lab	0	0	3	2
	Total Credits	**15**	**0**	**6**	**19**

SEMESTER IX

Course Code	Course Title	L	T	P	C
Theory					
ECT091	Open Source Systems	3	1	0	4
ECT092	Component Based Technology	3	0	0	3
ECT093	Middleware Technologies	3	0	0	3
	Elective – VII	3	0	0	3
	Elective – VIII	3	0	0	3
Practical					
ECT095	Open Source Systems Lab	0	0	3	2
ECT096	Component based Technology Lab	0	0	3	2
	Total Credits	**15**	**1**	**6**	**19**

Course Code	Course Title	L	T	P	C
ECT0101	Project Work - II	0	0	24	12
	Total Credits	0	0	24	12

LIST OF ELECTIVES FOR M.Sc. - COMPUTER TECHNOLOGY (5 YEARS)

Course Code	Course Title	L	T	P	C
	SEMSTER IV				
ECT501	Professional Ethics	3	0	0	3
ECT502	Principles of Data Communication	3	0	0	3
	SEMESTER V				
ECT503	Management Information Systems	3	0	0	3
ECT504	Network Security	3	0	0	3
ECT505	Image Processing	3	0	0	3
ECT506	Advanced DBMS	3	0	0	3
ECT507	Software Project Management	3	0	0	3
	SEMESTER VI				
ECT508	Mobile Computing	3	0	0	3
ECT509	Service Oriented Architecture	3	0	0	3
ECT510	Grid Computing	3	0	0	3
ECT511	Business Data Processing	3	0	0	3
	SEMESTER VIII				
ECT512	PC Testing and Trouble Shooting	3	0	0	3
ECT513	Neural Networks	3	0	0	3
ECT514	Fuzzy Logic	3	0	0	3
ECT515	Client Server Computing	3	0	0	3
ECT516	Information Security	3	0	0	3
	SEMESTER IX				
ECT517	Advanced Operating Systems	3	0	0	3
ECT518	Decision Support Systems	3	0	0	3
ECT519	Soft Computing	3	0	0	3
ECT520	Distributed Operating Systems	3	0	0	3
ECT521	Software Documentation	3	0	0	3

EEN011   **TECHNICAL ENGLISH I**   **L T P C**
                                                                                    4 0 0 4

UNIT – I   ENGLISH TODAY   **(12)**
Modern English : varieties of discourse—regional variations—accent and dialects— social variations—occupational varieties and scientific English—medium and attitude; speaking and writing; formal and informal style—language change—new ways of studying English.,

UNIT – II   EXTENDING VOCABULARY: STRUCTURAL AND CONTENT WORDS   (12)
Principles of word formation; abbreviations and acronyms; foreign words and phrases; idioms and phrases—everyday computer—related words; scientific and technical terms.

UNIT – III   GRAMMAR   **(12)**
Referring to people and things with the help of noun phrases- describing people and things with the help of determiners- adjectives and modifiers- making a message varying the message: negation question exclamation inversion – expressing words referring to time, place and manner- reporting what people say or think – combining messages: coordination and subordination- making text- the structure of information.

UNIT – IV   RECEPTIVE SKILL 1—LISTENING   **(12)**
Developing guided note taking from a lecture, recognizing and using descriptive words and phrases, completing information in a table, practicing dictation and checking spelling, developing accuracy in listening, imitating standard spoken English through native speakers' talk and presentation, listening for general and specific information, listening to news in the media and relating information to issues and locales around the world.

UNIT – V   RECEPTIVE SKILL 2—READING   **(12)**
Predicting the content – skimming the text for gist- identifying the topic sentences – guessing the meaning of words from contexts – scanning for specific information – transfer of information – cloze reading.
                                                                              TOTAL : 60
REFERENCES:

1. Adrian Doff & Christopher Jones, "Language in use – intermediate", Cambridge University Press, 2003.
2. Gail Ellis and Barbara Sinclair, "Learning to learn English: A course in learner training", Cambridge University Press, 1989.

EMA006   **APPLIED MATHEMATICS - I**   **L   T   P   C**
                                                                            3   1   0   4

UNIT – I   COMPLEX NUMBERS   (12)

Expansion of Sin n_ Cos n_ in terms of Sin _ and Cos _ - Expansion of Sinn_ ; Cosn _ in terms of sines and cosines of multiples of_ , hyperbolic functions. Inverse hyperbolic functions.

UNIT – II   MATRICES   (12)

Rank of matrix - consistency and inconsistency of a system of linear equations – Eigen values and Eigen vectors – Properties - Cayley Hamilton theorem – Reduction of Quadratic form to Canonical form by Orthogonal reduction.

UNIT – III   DEFINITE INTEGRALS   (12)

Reduction formula for integral of sinnx, cosn x, tann x – Definite integrals –Properties – Area of Cartesian Curves -– volumes of Revolution.

UNIT – IV   ORDINARY DIFFERENTIAL EQUATIONS   (12)

Solution of second order with constant coefficients and Variable coefficients - complimentary function – particular integrals – simultaneous linear equations with constant coefficients of first order.

UNIT – V   APPLICATION OF DIFFERENTIATION   (12)

Curvature of a curve – Radius of a curvature in Cartesian form - Centre of curvature – Circle of curvature – Evolutes and Envelopes.

                                                                    L:45 T:15 TOTAL:60

REFERENCES:

1. Veerarajan.T., "Engineering Mathematics", TMH Pub. Co. Ltd., New Delhi 1999.
2. Kandasamy.P., Thilagavathy.K. and Gunavathy.K. – "Engineering Mathematics, Volume – I", S.Chand & Co., New Delhi, 2001.

ECT011   **DIGITAL PRINCIPLES**   **L   T   P   C**
                                                                        3   0   0   3

UNIT I   **(12)**
Binary Systems : Digital Systems, Binary Numbers, Number Base Conversions, Octal and Hexadecimal Numbers, Complements, Signed Binary Numbers, Binary Codes, Binary Storage and Registers, Binary Logic Boolean Algebra and Logic Gates: Basic Theorems and Properties of Boolean Algebra, Boolean Functions, Canonical and Standard Forms, Digital Logic Gates.

UNIT – II   **(12)**
Minimization: K-Map Method – Table Method, POS - SOP, Don't Care Conditions, NAND, NOR Implementation, Introduction to HDL. Combinational Logic: Combinational Circuits, Analysis and Design Procedure, Binary Adder, Subtractor, Decimal Adder, Binary Multiplier, Magnitude Comparator,
Decoders, Encoders, Multiplexers.

UNIT – III   **(12)**
Synchronous Sequential Logic: Sequential Circutes - Latches, Flip-Flops, Analysis of Clocked Sequential Circuits, State Reduction and Assignment Design Procedure.

UNIT – IV   **(12)**
Registers and Counters: Registers, Shift Registers, Ripple Counters, Synchronous Counters, Ring Counters-Johnson Counter.

UNIT – V   **(12)**
Asynchronous Sequential Circuit : Introduction, Analysis Procedure, Circuits with Latches, Design Procedure, Reduction of State and Flow Tables, Race – Free State Assignment Hazards, Design Example.

                                                                        TOTAL: 60
REFERENCES:

1. M.Morris Mano, "Digital Design", 3rd edition, Pearson Education, Delhi, 2007.
2. Donald P Leech, Albert Paul Malvino and Goutam Saha, "Digital Principles and Applications", Tata Mc Graw Hill, 2007.

ECT012   COMPUTER CONCEPTS AND PROBLEM SOLVING   L   T   P   C
**   3   0   0   3**

UNIT – I   FUNDAMENTALS OF COMPUTERS   (12)
Evolution of Computers – Inputs/Outputs – Alternative Methods of Input – Organization of Modern Digital Computers – Operating System – Multitasking OS – Graphical User Interface.

UNIT – II   WORD PROCESSING   (12)
Word Processing Programs and Their Uses – Word Processor's Interface – Editing Text – Formatting Text –Macro- Special Features of Word – Desktop Publishing Service – Converting doc into www pages

UNIT – III   SPREADSHEET SOFTWARE   (12)
Spreadsheet Programs – applications – Spreadsheet package features, attributes - structure, label, data, importing data, formula, functions – data handling – Managing workbooks.

UNIT – IV   INTRODUCTION TO COMPUTER PROBLEM SOLVING   (12)
Introduction – Problem Solving aspects-Top-Down Design-Implementation of Algorithms – Program Verification-Efficiency of Algorithms-Analysis of Algorithm fundamental algorithm-factorial computation-generation of Fibonacci sequence.

UNIT – V   FACTORING AND ARRAY TECHNIQUES   (12)
Factoring Methods-finding the square root of a number-generating prime numbers- Array techniques-array order reversal-Finding the maximum number in a set- Removal of duplicates from an ordered Array-finding the kth smallest element.

**   TOTAL: 60**

REFERENCES:

1. Peter Norton,"Introduction to Computers",4th Edition, TMH Ltd, New Delhi, 2001.
2. R.G. Dromey,"How to solve it by Computers", Pearson Publishers, New Delhi, 2007.

ECT013	**PROGRAMMING IN C**	**L**	**T**	**P**	**C**
		3	**1**	**0**	**4**

UNIT – I   INTRODUCTION TO C LANGUGE   12

Overview of 'C'language – Constants, Variables and Data Types – Operators, Expressions and Assignment statements – Managing Input/Output Operations – Formatted I/O – Decision Making - Branching – IF, Nested IF – Switch – go to - Looping- While, do, for statements.

UNIT – II   ARRAYS AND FUNCTIONS   12

Arrays – dynamic and multi-dimensional arrays - Character arrays and Strings – String handling Functions - User defined Functions – Categories of Functions – Recursion.

UNIT – III   STRUCTURES AND UNIONS   12

Basics of Structures-Declaring a Structure – Array of Structures –Passing Structures elements to Functions- Passing entire Structure to Function – Structures within Structures - Union – Union of Structures – Enumerated Data Types – type of Statement.

UNIT – IV   POINTERS   12

Pointers – Declaration, Accessing a variable, dynamic memory allocation, Pointers versus Arrays, Array of pointers, Pointers to functions and structure Pointers.

UNIT – V   FILE MANAGEMENT   12

File Management in C – Data hierarchy- Files and Streams – Sequential access file- Random access file - Preprocessors.

L:45 T:15 TOTAL: 60

REFERENCES:

1. V.Rajaraman "Computer Programming in C" PHI, New Delhi, 2001
2. Kamthane, A.N., "Programming with ANSI and Turbo C", Pearson Education, Delhi, 2006.
3. Yashavant P. Kanetkar " Pointers In C" , BPB Publications, New Delhi, 2002
4. E.Balagurusamy " Programming in ANSI C " , Tata McGraw Hill, 2004
5. Deitel and Deitel " C How to Program ", Addisson Wesley , 2001

ECT015 **DIGITAL LAB** L T P C
                                                                                              0 0 3 2

LIST OF EXERCISES

1. Binary and BCD counter
2. Verification of NAND, NOR, XOR, AND, OR Gate Logic
3. Parity Generator
4. Multiplexer / Demultiplexers
5. Adder / Subtractor
6. Code Converters
7. Up / Down 4 bit Binary Counter
8. Up / Down 4 bit Decimal Counter
9. Shift Register
10. Ring Counter

TOTAL: 45

ECT016 **COMPUTER CONCEPTS AND PROBLEM SOLVING LABORATORY** L T P C
                                                                                              0 0 3 2

LIST OF EXERCISES
1. Word Processing
2. Spreadsheet
3. Power point
4. Factorial
5. Fibonacci
6. Prime Generation
7. Removal of duplicates from an ordered Array
8. Finding the kth smallest element.

TOTAL: 45

ECT017   **C PROGRAMMING LAB**   **L   T   P   C**
                                                            0   0   3   2

LIST OF EXERCISES

Implementation of

1. Input / output function

2. Control Functions

3. Functions

4. Arrays

5. Pointers

6. Structures and Unions

7. Files

Using case studies on: Roots of a quadratic equation, Measures of location – Matrix Operations – Evaluation of trigonometric functions – Pay roll problems. String operations like substring, concatenation, finding a string from a given paragraph, finding the number of words in a paragraph.

TOTAL: 45

EEN021   **TECHNICAL ENGLISH - II**   **L   T   P   C**
                                                                       4   0   0   4

UNIT – I ENGLISH TODAY   (12)
British and American Words – Communicating across cultures - Dealing with Discrimination – non verbal communication – values, beliefs & practices, Body language, The importance of Listening, Speaking and Interpersonal communication – purpose of Messages in Organization.

UNIT – II GRAMMAR (FOCUS ON LANGUAGE)   (12)
Identifying the lexical and contextual meaning of words – expanding nominal compounds – framing of questions ('Wh' pattern, yes/no questions, tag questions) Subject – verb agreement, use of articles, preposition and conditionals – impersonal passive – error detection and punctuation.

UNIT – III RECEPTIVE SKILLS 1 & 2 – LISTENING AND READING   (12)
Gap filling activity while listening - intensive listening – listening to a discourse and filling up gaps in a worksheet – comprehension tasks based on listening. Reading the gist to identify the topic sentence – its role – sequencing of sentences – transcoding diagrams – understanding discourse coherence and cohesion.

UNIT – IV PRODUCTIVE SKILL 1 – SPEAKING   (12)
Making Oral presentations – planning, kinds of presentation – adapting your ideas to audience, planning visual and other device to involve the audience – conducting language games to enrich spoken skills – facing interviews and negotiating benefits.

UNIT – V PRODUCTIVE SKILL 2 – WRITING   (12)
One sentence definition of technical terms – descriptions, paragraph writing, process description, check list, job application & resume, business letters (Calling for quotation, placing orders, enquiry etc) – Instruction and recommendation.

TOTAL : 60 PERIODS

REFERENCES:
1. Kitty O Locker, "Business Communication – Building critical Skills", Mc-Graw Hill, Third Edition 2007
2. Bridha Prabhakar, G. Subramanian, "Technical English for Engineering Students", Gems Publications, 2006.
3. Aysha Viswamohan, "English for Technical Communication", Tata McGraw Hill, 2007

EMA007   **APPLIED MATHEMATICS - II**   **L   T   P   C**
                                                                       3   1   0   4

UNIT – I MULTIPLE INTEGRALS   (12)
Double integration- Cartesian and polar co-ordinates- Change of order of integration- Area as a double integral, Change of variables between Cartesian and polar coordinates- Triple integration- Volume as a triple integral

UNIT – II FOURIER SERIES (12)
Dirichlet's condition-General Fourier series-Odd and even functions-Half range Fourier series-Parseval's identity-Harmonic analysis

UNIT – III COMPLEX DIFFERENTIATION (12)
Functions of complex variable-analytic function- Necessary condition-Cauchy Riemann equation –Sufficient conditions(excluding proof) -Properties of analytic functions–Harmonic conjugate - Construction of analytic functions-Conformal Mapping-w = z+a, w = az, w =1/z. w = z 2 - Bilinear Transformation.

UNIT – IV COMPLEX INTEGRATION (12)
Statement and applications of Cauchy's Integral theorem and formula-Taylor's and Laurent's expansions- Isolated singularities- Residues-Cauchy's residue theorem- Contour integration over unit circle and semi circular contour (excluding poles on boundaries)

UNIT – V LAPLACE TRANSFORM (12)
Laplace Transforms-Condition for existence-Transforms of Elementary functions- Basic properties-Derivatives and integrals of transforms- Transforms of derivatives and integrals – Initial and Final value theorem- Transform of unit step functions and impulse function – Transform of periodic function-Inverse Laplace transform- Convolution theorem-Solution of linear ODE of second order with constant coefficient, using Laplace transformation

L:45 T:15 TOTAL : 60 PERIODS

REFERENCES:

1. Kandasamy. P, Thilagavathy K and Gunavathy K, Engineering Mathematics for First year B.E/B.Tech, S.Chand and company Ltd, New Delhi-110055, Seventh Revised edition 2007
2. Veerarajan T , Engineering Mathematics (for First year) Tata Mc Graw Hill Publishing co.New Delhi 110008 (2008)
3. Grewal B.S , Higher Engineering Mathematics 38th edition , Khanna Publishers New Delhi (2004)

ECT021	MICROPROCESSORS	L	T	P	C
		3	0	0	3

UNIT – I (12)
8085 Microprocessor: The 8085 MPU – Architecture – Instruction formats – Addressing modes – Instruction set – Programming with 8085 – 8085 based microcomputer system.

UNIT – II **(12)**

8086 Software Aspects: Intel 8086 Microprocessor – Architecture – Assembly Language Programming – Linking and relocation – Stacks – Procedures – Macros - Interrupts and Interrupt Routines – Byte & String Manipulation.

UNIT – III **(12)**

8086 System Design: 8086 signals – Basic configurations – System bus timing – system design using 8086 – Multiprocessor configurations – Coprocessor, Closely coupled and loosely coupled configurations.

UNIT – IV **(12)**

I/O Interfaces: Serial Communication Interface – Parallel communication interface – Programmable Timer – Keyboard and Display controller – DMA controller – Interrupt controller – Maximum Mode and 16-bit bus interface designs.

UNIT – V **(12)**

Advanced Processors: Intel's 80X86 family of processors – Salient features of 80286, 80386, 80486 and the Pentium Processors.

TOTAL: 60 PERIODS

REFERENCES:

1. Ramesh s.gaonkar, "Microprocessor Architecture, Programming and Applications with the 8085", 4th Edition, Penram International Publishing (India) Pvt. Ltd., 1999.
2. Douglas v. Hall, "Microprocessors and Interfacing", Tata Mcgraw Hill, 1999.
3. Yu-cheng liu and Glenn a.Gibson, "Microcomputer Systems: The 8086/8088 Family Architecture, Programming & Design", 2nd Edition, Prentice Hall of India pvt. Ltd., 2001.
4. Barry b.Brey, "The Intel Microprocessors – 8086/8088, 80186, 286, 386, 486, Pentium and Pentium Pro Processor", Prentice Hall of India Pvt. Ltd., 1998.

ECT22	BASICS OF ELECTRICAL ENGINEERING	L	T	P	C
		3	0	0	3

UNIT – I FUNDAMENTALS OF DC AND AC CIRCUITS **12**

Fundamentals of DC circuits: Ohm's law, Kirchhoff's law, Simple resistive circuits – Effect of series and parallel resistances – Mesh and Nodal analysis – Simple problems. Fundamentals of AC circuits: RMS and Average values of sine wave, Form factor, Peak factor. Single phase AC circuits – Impedance - Power and Power Factor – Series RL,RC, RLC circuits - Simple problems

UNIT – II FUNDAMENTALS OF MAGNETIC CIRCUIT **12**

Ohm's law of magnetic circuit, Simple and composite magnetic circuits, Effect of air gap – leakage factor – fringing effect – Simple problems. Faraday's law of electromagnetic induction – Self and Mutually induced EMF – Statically and Dynamically induced EMF – Simple problems.

UNIT – III DC MACHINES AND TRANSFORMER   **12**

DC Machine: Construction – EMF equation of DC generator – Types of Generators and Motors – Characteristics..

Transformer: Construction – EMF equation – Transformation ratio – Types of Single Phase Transformers.

UNIT – IV INDUCTION MACHINES   **12**

Three phase Induction Motor: Construction, Types – Principle of Operation – Torque Equation – Slip Vs Torque Characteristics of Cage and wound rotor. Single Phase Induction Motor: Principle of Operation – Types – Applications.

UNIT – V POWER SUPPLIES   **12**

Half and Full wave rectifier - Bridge rectifier - rectification efficiency – transformer utility factor - voltage regulator- introduction to SMPS and UPS.

TOTAL: 60 PERIODS

REFERENCES:

1. B.L.Theraja, "Electrical Technology" - Vol I&II – Nirja construction and development company, New Delhi.
2. V.N.Mittle, "Basic Electrical Engineering", Tata Mc.Graw Hill, New Delhi, 2006.
3. V. Del Toro, "Electrical Engineering Fundamentals", PHI, NewDelhi, 1993.

ECT023	DATA STRUCTURES	L	T	P	C
		3	0	0	3

UNIT – I PROBLEM SOLVING   **(12)**

Problem solving – Top-down Design – Implementation – Verification – Efficiency – Analysis – Sample algorithms.

UNIT – II LISTS, STACKS AND QUEUES   **(12)**

Abstract Data Type (ADT) – The List ADT – The Stack ADT – The Queue ADT

UNIT – III TREES   **(12)**

Preliminaries – Binary Trees – The Search Tree ADT – Binary Search Trees – AVL Trees – Tree Traversals – Hashing – General Idea – Hash Function – Separate Chaining – Open Addressing – Linear Probing – Priority Queues (Heaps) – Model – Simple implementations – Binary Heap

UNIT – IV SORTING   **(12)**

Preliminaries – Insertion Sort – Shellsort – Heapsort – Mergesort – Quicksort – External Sorting

UNIT – V GRAPHS   **(12)**

Definitions – Topological Sort – Shortest-Path Algorithms – Unweighted Shortest Paths – Dijkstra's Algorithm – Minimum Spanning Tree – Prim's Algorithm – Applications of Depth-First Search – Undirected Graphs – Biconnectivity – Introduction to NP-Completeness

L:45 T:15 TOTAL: 60 PERIODS

REFERENCES:
1. R. G. Dromey, "How to Solve it by Computer" (Chaps 1-2), Prentice-Hall of India, 2002.
2. M. A. Weiss, "Data Structures and Algorithm Analysis in C", 2nd ed, Pearson Education Asia, 2002.
3. ISRD Group, "Data Structures using C", Tata McGraw Hill, 2007
4. Richard F. Gilberg, Behrouz A. Forouzan, "Data Structures – A Pseudocode Approach with C", ThomsonBrooks / COLE, 1998.

ECT025	MICROPROCESSORS LAB	L	T	P	C
		0	0	3	2

LIST OF EXERCISES

1. Fundamentals of 8085 Programming
2. Fundamentals of 8086 Programming
3. Interfacing with Input/Output Devices
4. Parallel peripheral Input/output – Timer – Keyboard Controller – Display Controller – Interrupt Controller, Communication Input/Output.

TOTAL: 45 PERIODS

ECT026	ELECTRICAL ENGINEERING LAB	L	T	P	C
	(Any 10 Experiments)	0	0	3	2

LIST OF EXPERIMENTS

1. Verification of Ohm's and Krichoff's Law
2. Measurement of Power and Impedance in RL, RC and RLC circuits
3. Swinburn's Test on D.C. Shunt Motor
4. Load Test on D.C.Shunt Motor
5. Load Test on D.C. Shunt Generator
6. Open Circuit and Load Characteristics of Separately Excited DC Generator
7. OC & SC Test on Single Phase Transformer
8. Load Test on Single Phase Transformer
9. Load Test on Single Phase and Three Phase Induction Motor
10. Single Phase Half Wave and Full Wave Rectifiers
11. Study of Passive Filters
12. Study of Voltage Regulator Circuits
13. Study of SMPS and UPS

TOTAL : 45 PERIODS

ECT027	DATA STRUCTURES LAB	L	T	P	C
		0	0	3	2

LIST OF EXERCISES

Implement the following exercises using C:
1. Array implementation of List Abstract Data Type (ADT)
2. Linked list implementation of List ADT
3. Cursor implementation of List ADT
4. Array implementations of Stack ADT
5. Linked list implementations of Stack ADT

The following three exercises are to be done by implementing the following source files
A. Program for 'Balanced Paranthesis'
B. Array implementation of Stack ADT
C. Linked list implementation of Stack ADT
D. Program for 'Evaluating Postfix Expressions'
An appropriate header file for the Stack ADT should be #included in (a) and (d)

6. Implement the application for checking 'Balanced Paranthesis' using array implementation of Stack ADT (by implementing files (a) and (b) given above)
7. Implement the application for checking 'Balanced Paranthesis' using linked list implementation of Stack ADT (by using file (a) from experiment 6 and implementing file (c))
8. Implement the application for 'Evaluating Postfix Expressions' using array and linked list implementations of Stack ADT (by implementing file (d) and using file (b), and then by using files (d) and (c))
9. Queue ADT
10. Search Tree ADT - Binary Search Tree
11. Heap Sort
12. Quick Sort

TOTAL: 45 PERIODS

SEMESTER III

EMA008	MATHEMATICAL STRUCTURES.	L	T	P	C
		3	1	0	4

UNIT I SET THEORY 12
Set theory: set notations   basic set operations - Venn diagram - laws of set theory   principles of inclusion and exclusion - partition - minsets – mathematical induction.

UNIT II PROPOSITIONAL CALCULUS   12

Propositions -   Truth table-logical operators – Tautologies and contradiction- Logical equivalences and implications- laws of logic - normal forms-   proofs in propositional calculus-Direct proof- conditional conclusion – indirect proof- Inconsistent set of premises.

UNIT III PREDICATE CALCULUS   12

Predicates- statement function – variables and quantifiers- Prdicate formulae- Free and bound variables- The Universe of discourse- logical implications and equivalence for quantified statements- Theory of inference of predicate calculus.

UNIT IV RELATIONS AND FUNCTIONS   12

Relations- Properties of relations- Equivalence relation- composition of relations- closure operations on relations- Fuctions-Injective, surjective, bijective functions- composisition of functions – inverse functions.

UNIT V FORMAL LANGUAGES AND AUTOMATA   12

Four classes of gammars- Types of grammars-normal forms-Derivation trees- ambiguous and unambiguous grammars- finite state automata(FSA)- nondeterministic finite state automata(NFSA)- conversion of non-deterministic automata to deterministic finite state automata. acceptance of a regular set by an FSA   construction of a right linear grammar from a finite automata.

L:45 T:15 TOTAL:60 PERIODS

REFERENCES:
1. Kenneth H.Rosen, " Discrete Mathematics and its Applications", Tata Mc Graw Hill, Fourth Edition, 2002.
2. J.P.Tremblay and Manohar , " Discrete Mathematical Structures with Applications to computer Science ", TMH ,1997.

ECT031   **OBJECT ORIENTED PROGRAMMING**   **L   T   P   C**
                                                              3   0   0   3

UNIT I INTRODUCTION   9

Object-oriented paradigm, elements of object oriented programming – Merits and demerits of OO methodology – C++ fundamentals – data types, operators and expressions, control flow, arrays, strings, pointers and functions.

UNIT II PROGRAMMING IN C++   10

Classes and objects – constructors and destructors, operator overloading – inheritance, virtual functions and polymorphism

UNIT III FILE HANDLING   9

C++ streams – console streams – console stream classes-formatted and unformatted console I/O operations, manipulators - File streams - classes file modes file pointers and manipulations file I/O – Exception handling

UNIT IV JAVA INTRODUCTION   9

An overview of Java, data types, variables and arrays, operators, control statements, classes, objects, methods – Inheritance.

UNIT V JAVA PROGRAMMING   9

Packages and Interfaces, Exception handling, Multithreaded programming, Strings, Input /Output.

                                                     TOTAL: 45 PERIODS

REFERENCES:

1. Herbert Schildt, "the Java 2 : Complete Reference", Fourth edition, TMH, 2002 (Unit IV, Unit-V)(Chapters 1-11,13,17)
2. Ira Pohl, "Object oriented programming using C++", Pearson Education Asia, 2003
3. Bjarne Stroustrup, "The C++ programming language", Addison Wesley, 2000
4. John R.Hubbard, "Progranning with C++", Schaums outline series, TMH, 2003
5. H.M.Deitel, P.J.Deitel, "Java : how to program", Fifth edition, Prentice Hall of India private limited.
6. E.Balagurusamy " Object Oriented Programming with C++", TMH 2/e

ECT032   **COMPUTER ARCHITECTURE**   **L   T   P   C**
                                                                3   0   0   3

UNIT I BASIC STRUCTURE OF COMPUTERS   10
Functional units - Basic operational concepts - Bus structures - Software performance – Memory locations and addresses – Memory operations – Instruction and instruction sequencing – Addressing modes – Assembly language – Basic I/O operations – Stacks and queues.

UNIT II ARITHMETIC UNIT   8
Addition and subtraction of signed numbers – Design of fast adders – Multiplication of positive numbers - Signed operand multiplication and fast multiplication – Integer division – Floating point numbers and operations.

UNIT III BASIC PROCESSING UNIT   9
Fundamental concepts – Execution of a complete instruction – Multiple bus organization – Hardwired control – Microprogrammed control - Pipelining – Basic concepts – Data hazards – Instruction hazards – Influence on Instruction sets – Data path and control consideration – Superscalar operation.

UNIT IV MEMORY SYSTEM   9
Basic concepts – Semiconductor RAMs - ROMs – Speed - size and cost – Cache memories - Performance consideration – Virtual memory- Memory Management requirements – Secondary storage.

UNIT V I/O ORGANIZATION   9
Accessing I/O devices – Interrupts – Direct Memory Access – Buses – Interface circuits – Standard I/O Interfaces (PCI, SCSI, USB).

                                                        T:15 TOTAL : 60 PERIODS

REFERENCES:
1. Carl Hamacher, Zvonko Vranesic and Safwat Zaky, 5th Edition "Computer Organization", McGraw-Hill, 2002.
2. William Stallings, "Computer Organization and Architecture – Designing for Performance", 6th Edition, Pearson Education, 2003.
3. David A.Patterson and John L.Hennessy, "Computer Organization and Design: The hardware / software interface", 2nd Edition, Morgan Kaufmann, 2002.
4. John P.Hayes, "Computer Architecture and Organization", 3rd Edition, McGraw Hill, 1998.

ECT033   **DATABASE MANAGEMENT SYSTEMS**   L   T   P   C
                                                                       3   0   0   3

UNIT I INTRODUCTION AND CONCEPTUAL MODELING   9
Introduction to File and Database systems- Database system structure – Data Models – Introduction to Network and Hierarchical Models – ER model – Relational Model – Relational Algebra and Calculus.

UNIT II RELATIONAL MODEL   9
SQL – Data definition- Queries in SQL- Updates- Views – Integrity and Security – Relational Database design – Functional dependences and Normalization for Relational Databases (up to BCNF).

UNIT III DATA STORAGE AND QUERY PROCESSING   9
Record storage and Primary file organization- Secondary storage Devices- Operations on Files- Heap File- Sorted Files- Hashing Techniques – Index Structure for files –Different types of Indexes- B-Tree - B+Tree – Query Processing.

UNIT IV TRANSACTION MANAGEMENT   9
Transaction Processing – Introduction- Need for Concurrency control- Desirable properties of Transaction- Schedule and Recoverability- Serializability and Schedules – Concurrency Control – Types of Locks- Two Phases locking- Deadlock- Time stamp based concurrency control – Recovery Techniques – Concepts- Immediate Update- Deferred Update - Shadow Paging.

UNIT V CURRENT TRENDS   9
Object Oriented Databases – Need for Complex Data types- OO data Model- Nested relations- Complex Types- Inheritance Reference Types - Distributed databases- Homogenous and Heterogenous- Distributed data Storage – XML – Structure of XML- Data- XML Document- Schema- Querying and Transformation. – Data Mining and Data Warehousing.

T:15 TOTAL :60 PERIODS

REFERENCES:

1. Abraham Silberschatz, Henry F. Korth and S. Sudarshan- "Database System Concepts", Fourth Edition, McGraw-Hill, 2002.
2. Ramez Elmasri and Shamkant B. Navathe, "Fundamental Database Systems", Third Edition, Pearson Education, 2003.
3. Raghu Ramakrishnan, "Database Management System", Tata McGraw-Hill Publishing Company, 2003.
4. Hector Garcia–Molina, Jeffrey D.Ullman and Jennifer Widom- "Database System Implementation"- Pearson Education- 2000.

ECT034　　　　　　　**ALGORITHMS DESIGN TECHNIQUE**　　　**L T P C**
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　　3 0 0 3

UNIT I　　　INTRODUCTION　　　　　　　　　　　　　　　　　9
Introduction – Notion of Algorithm - Fundamentals of algorithmic problem solving – Important problem types – Fundamentals of the analysis of algorithm efficiency – analysis frame work –   Asymptotic notations – Mathematical analysis for recursive and non-recursive   algorithms.

UNIT II　　　DIVIDE AND CONQUER METHOD AND GREEDY METHOD　　9
Divide and conquer methodology – Merge sort – Quick sort – Binary search – Binary tree traversal – Multiplication of large integers – Strassen's matrix   multiplication – Greedy method – Prim's algorithm – Kruskal's algorithm –   Dijkstra's algorithm.

UNIT III　　　DYNAMIC PROGRAMMING　　　　　　　　　　　　9
Computing a binomial coefficient – Warshall's and Floyd' algorithm – Optimal   binary search tree – Knapsack problem – Memory functions.

UNIT IV　　　BACKTRACKING AND BRANCH AND BOUND　　　　　9
Backtracking – N-Queens problem – Hamiltonian circuit problem – Subset sum problem – Branch and bound – Assignment problem – Knapsack problem –   Traveling salesman problem.

UNIT V　　　NP-HARD AND NP-COMPLETE PROBLEMS　　　　　　9
P & NP problems – NP-complete problems – Approximation algorithms for NP-hard problems – Traveling salesman problem – Knapsack problem.
　　　　　　　　　　　　　　　　　　　　　　　　　　　　　TOTAL : 45

REFERENCES:
1. Anany Levitin "Introduction to the Design and Analysis of Algorithms" Pearson   Education 2003.
2. Thomas H.Cormen, Charles E.Leiserson, Ronald L.Rivest, "Introduction to   algorithms" Prentice Hall 1990.
3. SaraBaase and Allen Van Gelder, "Computer Algorithms – Introduction to Design and Analysis" Pearson education, 2003.
4. A.V.Aho, J.E Hopenfit and J.D.Ullman, "The Design and Analysis of Computer algorithms" Pearson education Asia, 2003.

ECT036   **OBJECT ORIENTED PROGRAMMING LAB**   **L T P C**
                                                                            0 0 3 2

C++

1.   Programs Using Functions
-      Functions with default arguments
-      Implementation of Call by Value, Call by Address and Call by Reference

2.   Simple Classes for understanding objects, member functions and Constructors
-      Classes with primitive data members
-      Classes with arrays as data members
-      Classes with pointers as data members – String Class
-      Classes with constant data members
-      Classes with static member functions

3.   Compile time Polymorphism
-      Operator Overloading including Unary and Binary Operators.
-      Function Overloading

4.   Runtime Polymorphism
-      Inheritance
-      Virtual functions
-      Virtual Base Classes
-      Templates

5.   File Handling
-      Sequential access
-      Random access

JAVA

6.   Simple Java applications
-      for understanding reference to an instance of a class (object), methods
-      Handling Strings in Java

7.   Simple Package creation.
-      Developing user defined packages in Java

8.   Interfaces
-      Developing user-defined interfaces and implementation
-      Use of predefined interfaces

9.   Threading
-      Creation of thread in Java applications
-      Multithreading

10.   Exception Handling Mechanism in Java
-      Handling pre-defined exceptions
-      Handling user-defined exceptions

ECT037   **DATABASE MANAGEMENT SYSTEMS LAB**   **L   T   P   C**
                                                                0   0   3   2

LIST OF EXPERIMENTS

1. Data Definition Language (DDL) commands in RDBMS.
2. Data Manipulation Language (DML) and Data Control Language (DCL) commands in RDBMS.
3. High-level language extension with Cursors.
4. High level language extension with Triggers
5. Procedures and Functions.
6. Embedded SQL.
7. Database design using E-R model and Normalization.
8. Design and implementation of Payroll Processing System.
9. Design and implementation of Banking System.
10. Design and implementation of Library Information System.

ECT038   **ALGORITHMS LAB**   **L   T   P   C**
                                                                0   0   3   2

1. Apply the divide and Conquer technique to arrange a set of numbers using merge sort method.

2. Perform Strassen's matrix multiplication using divide and conquer method.

3. Solve the knapsack problem using greedy method.

4. Construct a minimum spanning tree using greedy method.

5. Construct optimal binary search trees using dynamic programming method of problem solving.

6. Find the solution for traveling salesperson problem using dynamic programming approach.

7. Perform graph traversals.

8. Implement the 8-Queens Problem using backtracking.

9. Implement knapsack problem using backtracking.

10. Find the solution of traveling salesperson problem using backtracking

EMA010   **OPERATIONS RESEARCH**   **L   T   P   C**
                                                              3   1   0   4

UNIT I LINEAR PROGRAMMING: **9**
Principal components of decision problem – Modeling phases – LP Formulation and graphic solution – Resource allocation problems – Simplex method – Sensitivity analysis.

UNIT II DUALITY AND NETWORKS: **9**
Definition of dual problem – Primal – Dual relation ships – Dual simplex methods – Post optimality analysis – Transportation and assignment model shortest route problem.

UNIT III INTEGER PROGRAMMING: **9**
Cutting plan algorithm – Branch and bound methods, Multistage (Dynamic) programming.

UNIT IV CLASSICAL OPTIMISATION THEORY: **9**
Unconstrained external problems, Newton – Ralphson method – Equality constraints – Jacobean methods – Lagrangian method – Kuhn – Tucker conditions – Simple problems.

UNIT V OBJECT SCHEDULING: **9**
Network diagram representation – Critical path method – Time charts and resource leveling – PERT.

                                                                    TOTAL:45

REFERNECES:
1. Anderson 'Quantitative Methods for Business', 8th Edition, Thomson Learning, 2002.
2. Winston 'Operation Research', Thomson Learning, 2003.
3. H.A.Taha, 'Operation Research', Prentice Hall of India, 2002.
4. Vohra, 'Quantitative Techniques in Management', Tata McGraw Hill, 2002.
5. Anand Sarma, 'Operation Research', Himalaya Publishing House, 2003.

ECT041   **OPERATING SYSTEMS**   **L   T   P   C**
                                                              3   0   0   3
UNIT I   **9**
Introduction - Mainframe systems – Desktop Systems – Multiprocessor Systems – Distributed Systems – Clustered Systems – Real Time Systems – Handheld Systems - Hardware Protection - System Components – Operating System Services – System Calls – System Programs - Process Concept – Process Scheduling – Operations on Processes – Cooperating Processes – Inter-process Communication.

UNIT II   **9**
Threads – Overview – Threading issues - CPU Scheduling – Basic Concepts – Scheduling Criteria – Scheduling Algorithms – Multiple-Processor Scheduling – Real Time Scheduling - The Critical-Section Problem – Synchronization Hardware – Semaphores – Classic problems of Synchronization – Critical regions – Monitors.

UNIT III 9

System Model – Deadlock Characterization – Methods for handling Deadlocks -Deadlock Prevention – Deadlock avoidance – Deadlock detection – Recovery from Deadlocks - Storage Management – Swapping – Contiguous Memory allocation – Paging – Segmentation – Segmentation with Paging.

UNIT IV 9

Virtual Memory – Demand Paging – Process creation – Page Replacement – Allocation of frames – Thrashing - File Concept – Access Methods – Directory Structure – File System Mounting – File Sharing – Protection

UNIT V 9

File System Structure – File System Implementation – Directory Implementation – Allocation Methods – Free-space Management. Kernel I/O Subsystems - Disk Structure – Disk Scheduling – Disk Management – Swap-Space Management. Case Study: The Linux System, Windows

TOTAL: 45

REFERENCES:

1. Abraham Silberschatz, Peter Baer Galvin and Greg Gagne, "Operating System Concepts", Sixth Edition, John Wiley & Sons (ASIA) Pvt. Ltd, 2003.
2. Harvey M. Deitel, "Operating Systems", Second Edition, Pearson Education Pvt. Ltd, 2002.
3. William Stallings, "Operating System", Prentice Hall of India, 4th Edition, 2003.
4. Pramod Chandra P. Bhatt – "An Introduction to Operating Systems, Concepts and Practice", PHI, 2003.

ECT042	INTERNET PROGRAMMING	L	T	P	C
		3	0	0	3

UNIT I BASIC NETWORK AND WEB CONCEPTS 9

Internet standards – TCP and UDP protocols – URLs – MIME – CGI – Introduction to SGML.

UNIT II JAVA PROGRAMMING 9

Java basics – I/O streaming – files – Looking up Internet Address - Socket programming – client/server programs – E-mail client – SMTP - POP3 programs – web page retrieval – protocol handlers – content handlers - applets – image handling - Remote Method Invocation.

UNIT III SCRIPTING LANGUAGES 9

HTML – forms – frames – tables – web page design - JavaScript introduction – control structures – functions – arrays – objects – simple web applications

UNIT IV DYNAMIC HTML 9

Dynamic HTML – introduction – cascading style sheets – object model and collections – event model – filters and transition – data binding – data control – ActiveX control – handling of multimedia data

UNIT V SERVER SIDE PROGRAMMING 9

Servlets – deployment of simple servlets – web server (Java web server / Tomcat / Web logic) – HTTP GET and POST requests – session tracking – cookies – JDBC – simple web applications – multi-tier applications.

TOTAL: 45

REFERENCES:

1. Deitel, Deitel and Nieto, "Internet and World Wide Web – How to program", Pearson Education Publishers, 2000.
2. Elliotte Rusty Harold, "Java Network Programming", O'Reilly Publishers, 2002
3. R. Krishnamoorthy & S. Prabhu, "Internet and Java Programming", New Age International Publishers, 2004.
4. Thomno A. Powell, "The Complete Reference HTML and XHTML", fourth edition, Tata McGraw Hill, 2003.
5. Naughton, "The Complete Reference – Java2", Tata McGraw-Hill, 3rd edition, 1999.

ECT043	SOFTWARE ENGINEERING	L	T	P	C
		3	0	0	3

UNIT I SOFTWARE PROCESS 9

Introduction –S/W Engineering Paradigm – life cycle models (water fall, incremental, spiral, WINWIN spiral, evolutionary, prototyping, object oriented) - system engineering – computer based system – verification – validation – life cycle process – development process –system engineering hierarchy.

UNIT II SOFTWARE REQUIREMENTS 9

Functional and non-functional - user – system –requirement engineering process – feasibility studies – requirements – elicitation – validation and management – software prototyping – prototyping in the software process – rapid prototyping techniques – user interface prototyping - S/W document. Analysis and modeling – data, functional and behavioral models – structured analysis and data dictionary.

UNIT III DESIGN CONCEPTS AND PRINCIPLES 9

Design process and concepts – modular design – design heuristic – design model and document. Architectural design – software architecture – data design – architectural design – transform and transaction mapping – user interface design – user interface design principles. Real time systems - Real time software design – system design – real time executives – data acquisition system - monitoring and control system. SCM – Need for SCM – Version control – Introduction to SCM process – Software configuration items.

UNIT IV TESTING 9

Taxonomy of software testing – levels – test activities – types of s/w test – black box testing – testing boundary conditions – structural testing – test coverage criteria based on data flow mechanisms – regression testing – testing in the large. S/W testing strategies – strategic approach and issues - unit testing – integration testing – validation testing – system testing and debugging.

UNIT V SOFTWARE PROJECT MANAGEMENT **9**

Measures and measurements – S/W complexity and science measure – size measure – data and logic structure measure – information flow measure. Software cost estimation – function point models – COCOMO model- Delphi method.- Defining a Task Network – Scheduling – Earned Value Analysis – Error Tracking - Software changes – program evolution dynamics – software maintenance – Architectural evolution. Taxonomy of CASE tools.

TOTAL : 45

REFERENCES:
1. Roger S.Pressman, Software engineering- A practitioner's Approach, McGraw-Hill International Edition, 6th edition, 2004.
2. Ian Sommerville, Software engineering, Pearson education Asia, 6th edition, 2000.
3. Pankaj Jalote- An Integrated Approach to Software Engineering, Springer Verlag, 1997.
4. James F Peters and Witold Pedryez, "Software Engineering – An Engineering Approach", John Wiley and Sons, New Delhi, 2000.

ECT045	OPERATING SYSTEMS LAB	L	T	P	C
		0	0	3	2

(Implement the following on LINUX platform. Use C for high level language implementation)
1. Shell programming
   - Command syntax
   - write simple functions
   - basic tests
2. Shell programming
   - loops
   - patterns
   - expansions
   - substitutions
3. Write programs using the following system calls of UNIX operating system:
   fork, exec, getpid, exit, wait, close, stat, opendir, readdir
4. Write programs using the I/O system calls of UNIX operating system (open, read, write, etc)
5. Write C programs to simulate UNIX commands like ls, grep, etc.
6. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
7. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time
8. Implement the Producer – Consumer problem using semaphores.
9. Implement some memory management schemes – I
10. Implement some memory management schemes – II

Example for expt 9 & 10 :

Free space is maintained as a linked list of nodes with each node having the starting byte address and the ending byte address of a free block. Each memory request consists of the process-id and the amount of storage space required in bytes. Allocated memory space is again maintained as a linked list of nodes with each node having the process-id, starting byte address and the ending byte address of the allocated space.

When a process finishes (taken as input) the appropriate node from the allocated list should be deleted and this free disk space should be added to the free space list. [Care should be taken to merge contiguous free blocks into one single block. This results in deleting more than one node from the free space list and changing the start and end address in the appropriate node]. For allocation use first fit, worst fit and best fit.

ECT046	**INTERNET PROGRAMMING LABORATORY**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

LIST OF EXPERIMENTS

1. Write programs in Java to demonstrate the use of following components Text fields, buttons, Scrollbar, Choice, List and Check box

2. Write Java programs to demonstrate the use of various Layouts like Flow Layout, Border Layout, Grid layout, Grid bag layout and card layout

3. Write programs in Java to create applets incorporating the following features:

    Create a color palette with matrix of buttons
    Set background and foreground of the control text area by selecting a color from color
        palette.
    In order to select Foreground or background use check box control as radio buttons
    To set background images

4. Write programs in Java to do the following.

    Set the URL of another server.
    Download the homepage of the server.
    Display the contents of home page with date, content type, and Expiration date. Last modified and length of the home page.

5. Write programs in Java using sockets to implement the following:
    HTTP request
    FTP
    SMTP
    POP3

6. Write a program in Java for creating simple chat application with datagram sockets and datagram packets.

7.   Write programs in Java using Servlets:

      To invoke servlets from HTML forms
      To invoke servlets from Applets
8.   Write programs in Java to create three-tier applications using servlets
      for conducting on-line examination.
      for displaying student mark list. Assume that student information is available in a
      database which has been stored in a database server.
9.   Create a web page with the following using HTML
      To embed a map in a web page
      To fix the hot spots in that map
      Show all the related information when the hot spots are clicked.
10.   Create a web page with the following.

      i)   Cascading style sheets.
      ii)   Embedded style sheets.
      iii) Inline style sheets.
      iv)   Use your college information for the web pages.

ECT047	**SOFTWARE ENGINEERING LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

1.   Study of case tools   such as rational rose or equivalent tools

2.   Requirements
      Implementation of requirements engineering activities such as elicitation, validation,
      management using case tools

4.   Analysis and design
      Implementation of analysis and design using case tools.

5.   Study and usage of software project management tools such cost estimates and
      scheduling

6.   Documentation generators - Study and practice of Documentation
      generators.

7.   Data modeling using automated tools.

8.   Practice reverse engineering and re engineering using tools.

9.   Exposure towards test plan generators, test case generators, test coverage and
      software metrics.

   11. Meta modeling and software life cycle management.

ECT051   **COMPUTER NETWORKS**   **L   T   P   C**
                                                                                      3   0   0   3

UNIT I DATA COMMUNICATIONS   8

Components – Direction of Data flow – networks – Components and Categories – types of Connections – Topologies –Protocols and Standards – ISO / OSI model – Transmission Media – Coaxial Cable – Fiber Optics – Line Coding – Modems – RS232 Interfacing sequences.

UNIT II DATA LINK LAYER   10

Error – detection and correction – Parity – LRC – CRC – Hamming code – low Control and Error control - stop and wait – go back-N ARQ – selective repeat ARQ- sliding window – HDLC. - LAN - Ethernet IEEE 802.3 - IEEE 802.4 - IEEE 802.5 - IEEE 802.11 – FDDI - SONET – Bridges.

UNIT III NETWORK LAYER   10

Internetworks – Packet Switching and Datagram approach – IP addressing methods – Subnetting – Routing – Distance Vector Routing – Link State Routing – Routers.

UNIT IV TRANSPORT LAYER   9

Duties of transport layer – Multiplexing – Demultiplexing – Sockets – User Datagram Protocol (UDP) – Transmission Control Protocol (TCP) – Congestion Control – Quality of services (QOS) – Integrated Services.

UNIT V APPLICATION LAYER   8

Domain Name Space (DNS) – SMTP – FTP – HTTP - WWW – Security – Cryptography.

                                                                          TOTAL : 45

REFERENCES:

1. Behrouz A. Forouzan, "Data communication and Networking", Tata McGraw-Hill, 2004.
2. James F. Kurose and Keith W. Ross, "Computer Networking: A Top-Down Approach Featuring the Internet", Pearson Education, 2003.
3. Andrew S. Tanenbaum, "Computer Networks", PHI, Fourth Edition, 2003.
4. William Stallings, "Data and Computer Communication", Sixth Edition, Pearson Education, 2000.

ECT052   **COMPUTER GRAPHICS**   **L   T   P   C**
                                                                                      3   0   0   3

UNIT I INTRODUCTION & OVERVIEW OF GRAPHICS SYSTEMS   9

Introduction - Computer Aided Design – Presentation Graphics – Computer Art – Entertainment – Education and Training – Visualization – Image processing – Graphical User Interface – Video Display Devices – Raster Scan Systems – Random Scan Systems – Graphics monitors and workstations – Input Devices – Hard Copy Devices – Graphics Software

UNIT II OUTPUT PRIMITIVES & ATTRIBUTES OF OUTPUT PRIMITIVES   9

Points and Lines – Line Drawing Algorithms – Loading the frame buffer – Line function – Circle generating algorithms – Ellipse generating algorithms – Filled area primitives – Line attributes – Curve Attributes – Color and Grayscale Levels – Area-Fill attributes – Character Attributes – Inquiry Functions - Antialiasing

UNIT III TWO DIMENSIONAL GEOMETRIC TRANSFORMATIONS   9

Basic transformations – Matrix representations – Composite Transformations – other transformations - Affine Transformations – Transformation Functions – Raster Methods for Transformations – Viewing Pipeline – Window–to-Viewport coordinate Transformation – Two Dimensional Viewing Functions – Clipping Operations – Point Clipping – Line Clipping – Polygon Clipping – Curve Clipping – Text Clipping – Exterior Clipping.

UNIT IV GRAPHICAL USER INTERFACES & INTERACTIVE INPUT METHODS   9

The user Dialogue – Input of Graphical Data – Input Functions – Interactive Picture Construction Techniques – Virtual Reality Environments – Three Dimensional Object Representation: polygon surfaces-curved line and surfaces-Quadric surface-super Quadrics - Blobby objects - Bezier curves and surfaces - constructive solid geometry methods – Octrees - BSP trees.

UNIT V THREE DIMENSIONAL CONCEPTS & APPLICATIONS   9

Three dimensional geometric and modeling transformations - Visible-surface Detection methods-polygon rendering methods-color models and color applications-computer animation..

                                                                                TOTAL : 45 PERIODS

REFERENCES:
1. Donald Hearn and Pauline Baker, "Computer Graphics C version", Pearson Education, 2003.
2. Foley, Vandam, Feiner, Huges, "Computer Graphics: Principles & Practice", Pearson Education 2003.
3. Schaum's Outline of Computer Graphics By Zhigang Xiang and Roy A Plastock , TMH 2000

ECT053	MULTIMEDIA SYSTEMS	L	T	P	C
		3	0	0	3

UNIT-I INTRODUCTION TO MULTIMEDIA   9

Introduction to making Multimedia- Multimedia Skills and training- Text: Using text in Multimedia-Computer and Text- Font Editing and Design Tools- Hypermedia and Hypertext

UNIT II MULTIMEDIA FILE HANDLING   9

Sound – Images – Animation - Video

UNIT –III DIGITAL VIDEO AND IMAGE COMPRESSION   9

Evaluating a compression system - Redundancy and visibility-Video compression techniques-Standardization of an algorithm - The JPEG image compression standard-
ITU –T Standards - MPEG   motion video compression standard-DVI Technology.

UNIT-IV HARDWARE, SOFTWARE AND MULTIMEDIA AUTHORING TOOLS **9**

Multimedia Hardware: Macintosh and Windows production platforms-Hardware Peripherels: Memory and Storage Devices, Input Devices, Output Devices, Communication Devices .Basic Software Tools

UNIT V MULTIMEDIA AND INTERNET **9**

Internetworking –connections -Internet services -Tools for WWW - Designing WWW.

TOTAL : 45 PERIODS

REFERENCES:

1. Multimedia: Making It Work, Tay Vaughan, 7th Edition, Tata Mc-Graw Hill. (Unit I, II, IV and V), 2008.
2. Multimedia Systems, John F.Koegel Buford, Pearson edition, 2003. (unit III).
3. Ranjan Parekh, Principles of Multimedia, TMH, 2006.
4. Multimedia: Computing, Communication and applications, Ralf Steinmetz and Klara Nahrstedt, Pearson Edition, 2001.

ECT055	**NETWORKS LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

1. Applications using TCP Sockets like
   a. Echo client and echo server
   b. File transfer
   c. Remote command execution
   d. Chat
   e. Concurrent server

2. Applications using UDP Sockets like
   a. DNS
   b. SNMP

3. Applications using Raw Sockets like
   a. Ping
   b. Trace route

4. RPC

5. Experiments using simulators like OPNET:
   a. Performance comparison of MAC protocols
   b. Performance comparison of Routing protocols
   c. Study of TCP/UDP performance

ECT056	**COMPUTER GRAPHICS LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

1. Implementation of Line Drawing Algorithms

    a) DDA

    b) Bresenham

2. Implementation of Bresenham's Circle Generation Algorithm

3. Implementation of Bresenham's Ellipse Generation Algorithm

4. Implementation of Two Dimensional Transformations

5. Implementation of Cohen-Sutherland Line Clipping Algorithm

6. Implementation of Sutherland-Hodgement Polygon Clipping Algorithm

7. Implementation of 2D Window – to – Viewport Conversion

8. Implementation of 3D Transformations

9. Animation Using C Graphics

ECT057	**MULTIMEDIA SYSTEMS LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

1. Create a simple painting program using Flash or equivalent.
2. Create a simple animated banner using Flash or equivalent.
3. Design an object dragging program.
4. Prepare a photo album using Flash or equivalent.
5. Create animated buttons which is used for web design using Adobe Photoshop or equivalent.
6. Design image mapping using Flash or equivalent.
7. Create image morphing using adobe Photoshop or equivalent.
8. Make animations using macromedia Flash or equivalent.
9. Create animated Gifs for use as banners, titles and buttons.
10. Create short film in Flash or equivalent using any theme.
11. To perform animation using any animation software.

To perform image editing using basic tool, masking effect and rendering effects using Photoshop or equivalent.

ECT061   **PRINCIPLES OF MANAGEMENT**   L   T   P   C
                                                                       3   0   0   3

UNIT I HISTORICAL DEVELOPMENT   9
Definition of Management – Science or Art – Management and Administration – Development of Management Thought – Contribution of Taylor and Fayol – Functions of Management – Types of Business Organisation.

UNIT II PLANNING   9
Nature & Purpose – Steps involved in Planning – Objectives – Setting Objectives – Process of Managing by Objectives – Strategies, Policies & Planning Premises- Forecasting – Decision-making.

UNIT III ORGANISING   9
Nature and Purpose – Formal and informal organization – Organization Chart – Structure and Process – Departmentation by difference strategies – Line and Staff authority – Benefits and Limitations – De-Centralization and Delegation of Authority – Staffing – Selection Process - Techniques – HRD – Managerial Effectiveness.

UNIT IV DIRECTING   9
Scope – Human Factors – Creativity and Innovation – Harmonizing Objectives – Leadership – Types of Leadership Motivation – Hierarchy of needs – Motivation theories – Motivational Techniques – Job Enrichment – Communication – Process of Communication – Barriers and Breakdown – Effective Communication – Electronic media in Communication.

UNIT V CONTROLLING   9
System and process of Controlling – Requirements for effective control – The Budget as Control Technique – Information Technology in Controlling – Use of computers in handling the information – Productivity – Problems and Management – Control of Overall Performance – Direct and Preventive Control – Reporting – The Global Environment – Globalization and Liberalization – International Management and Global theory of Management.

                                                                        TOTAL: 45 PERIODS

REFERENCES:

1. Harold Kooritz & Heinz Weihrich "Essentials of Management", Tata McGraw-Hill, 1998.
2. Joseph L Massie "Essentials of Management", Prentice Hall of India, (Pearson) Fourth Edition, 2003.
3. Tripathy PC And Reddy PN, " Principles of Management", Tata McGraw-Hill, 1999.
4. Decenzo David, Robbin Stephen A, "Personnel and Human Reasons Management", Prentice Hall of India, 1996

ECT062   **NETWORK SECURITY**   **L   T   P   C**
                                                                      3   0   0   3

1. INTRODUCTION   9
Attacks - Services - Mechanisms - Conventional Encryption - Classical And Modern Techniques – Encryption Algorithms - Confidentiality.

2. PUBLIC KEY ENCRYPTION   9
RSA - Elliptic Curve Cryptography - Number Theory Concepts

3. MESSAGE AUTHENTICATION   9
Hash Functions - Digest Functions - Digital Signatures - Authentication Protocols.

4. NETWORK SECURITY PRACTICE   9
Authentication, Applications - Electronic Mail Security - IP Security - Web Security.

5. SYSTEM SECURITY   9
Intruders – Viruses – Worms – Firewalls Design Principles – Trusted Systems.

                                                          TOTAL: 45 PERIODS
REFERENCES:

1. Stallings, Cryptography & Network Security - Principles & Practice, Prentice Hall, 3rd Edition 2002.
2. Bruce, Schneier, Applied Cryptography, 2nd Edition, Toha Wiley & Sons, 1996.
3. Man Young Rhee, "Internet Security", Wiley, 2003.
4. Pfleeger & Pfleeger, "Security in Computing", Pearson Education, 3rd Edition, 2003.

ECT063   **COMPILER DESIGN**   **L   T   P   C**
                                                                      3   0   0   3

UNIT I INTRODUCTION TO COMPILING   9
Compilers – Analysis of the source program – Phases of a compiler – Cousins of the Compiler – Grouping of Phases – Compiler construction tools – Lexical Analysis – Role of Lexical Analyzer – Input Buffering – Specification of Tokens.

UNIT II SYNTAX ANALYSIS   9
Role of the parser –Writing Grammars –Context-Free Grammars – Top Down parsing – Recursive Descent Parsing – Predictive Parsing – Bottom-up parsing – Shift Reduce Parsing – Operator Precedent Parsing – LR Parsers – SLR Parser – Canonical LR Parser – LALR Parser.

UNIT III INTERMEDIATE CODE GENERATION   9
Intermediate languages – Declarations – Assignment Statements – Boolean Expressions – Case Statements – Back patching – Procedure calls.

UNIT IV CODE GENERATION 9

Issues in the design of code generator – The target machine – Runtime Storage management – Basic Blocks and Flow Graphs – Next-use Information – A simple Code generator – DAG representation of Basic Blocks – Peephole Optimization.

UNIT V CODE OPTIMIZATION AND RUN TIME ENVIRONMENTS 9

Introduction– Principal Sources of Optimization – Optimization of basic Blocks – Introduction to Global Data Flow Analysis – Runtime Environments – Source Language issues – Storage Organization – Storage Allocation strategies – Access to non-local names – Parameter Passing.

T: 15 TOTAL: 60 PERIODS

REFERENCES:

1. Alfred Aho, Ravi Sethi, Jeffrey D Ullman, "Compilers Principles, Techniques and Tools", Pearson Education Asia, 2003.
2. Allen I. Holub "Compiler Design in C", Prentice Hall of India, 2003.
3. C. N. Fischer and R. J. LeBlanc, "Crafting a compiler with C", Benjamin Cummings, 2003.
4. J.P. Bennet, "Introduction to Compiler Techniques", Second Edition, Tata McGraw-Hill, 2003.

ECT064	ARTIFICIAL INTELLIGENCE	L	T	P	C
		3	0	0	3

UNIT I INTRODUCTION 8

Intelligent Agents – Agents and environments - Good behavior – The nature of environments – structure of agents - Problem Solving - problem solving agents – example problems – searching for solutions – uniformed search strategies - avoiding repeated states – searching with partial information.

UNIT II SEARCHING TECHNIQUES 10

Informed search and exploration – Informed search strategies – heuristic function – local search algorithms and optimistic problems – local search in continuous spaces – online search agents and unknown environments - Constraint satisfaction problems (CSP) – Backtracking search and Local search for CSP – Structure of problems - Adversarial Search – Games – Optimal decisions in games – Alpha – Beta Pruning – imperfect real-time decision – games that include an element of chance.

UNIT III KNOWLEDGE REPRESENTATION 10

First order logic – representation revisited – Syntax and semantics for first order logic – Using first order logic – Knowledge engineering in first order logic - Inference in First order logic – prepositional versus first order logic – unification and lifting – forward chaining – backward chaining - Resolution - Knowledge representation - Ontological Engineering - Categories and objects – Actions - Simulation and events - Mental events and mental objects

UNIT IV LEARNING **9**

Learning from observations - forms of learning - Inductive learning - Learning decision trees - Ensemble learning - Knowledge in learning – Logical formulation of learning – Explanation based learning – Learning using relevant information – Inductive logic programming - Statistical learning methods - Learning with complete data - Learning with hidden variable - EM algorithm - Instance based learning - Neural networks - Reinforcement learning – Passive reinforcement learning - Active reinforcement learning - Generalization in reinforcement learning.

UNIT V APPLICATIONS **8**

Communication – Communication as action – Formal grammar for a fragment of English – Syntactic analysis – Augmented grammars – Semantic interpretation – Ambiguity and disambiguation – Discourse understanding – Grammar induction - Probabilistic language processing - Probabilistic language models – Information retrieval – Information Extraction – Machine translation.

TOTAL: 45 PERIODS

REFERENSES:

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", 2nd Edition, Pearson Education / Prentice Hall of India, 2004.
2. Nils J. Nilsson, "Artificial Intelligence: A new Synthesis", Harcourt Asia Pvt. Ltd., 2000.
3. Elaine Rich and Kevin Knight, "Artificial Intelligence", 2nd Edition, Tata McGraw-Hill, 2003.

ECT066	**NETWORK SECURITY LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

Symmetric Ciphers
1. Programs for Substitution ciphers using Caesar Cipher
2. Implementation of Multiplicative Ciphers
3. Implementation of Poly alphabetic Ciphers
    a. Playfair Cipher
    b. Vigenere Cipher
    c. Hill Cipher
4. Implementation of DES Cipher
    a. Key Generation
    b. Encryption
    c. Decryption
Modes of symmetric Ciphers
5. Implementation of Electronic Code Book (ECB)
6. Implementation of Cipher Block Chaining (CFC)
7. Implementation of Cipher Feed Back (CFB)
8. Implementation of Output Feedback Mode (OFM)
9. Implementation of Counter Mode (CTR)

Asymmetric Ciphers
   10. Implementation of Primality Testing using,
          a. Miller Robin Technique
          b. Chinese Remainder Theorem
   11. Implementation of Encryption and Decryption using RSA Algorithm
Authentication and Key Management
   12. Implementation of MAC Generation
   13. Implementation of H MAC Generation
   14. Implementation of CMAC Generation
   15. Implementation of Diffie Hellman Key Exchange Algorithm
E-mail and Network Security
   16. Implementation of PGP Algorithms
   17. Implementation of Secure File Transmission using SSL/TLS in Local Network

(Note : Minimum 12 Experiments covering all the five groups)

ECT067   **COMPILER DESIGN LAB**   **L   T   P   C**
                                                                  0   0   3   2

1 & 2   Implement a lexical analyzer in "C".
3.   Use LEX tool to implement a lexical analyzer.
4.   Implement a recursive descent parser for an expression grammar that generates arithmetic expressions with digits, + and *.
5.   Use YACC and LEX to implement a parser for the same grammar as given in problem
6.   Write semantic rules to the YACC program in problem 5 and implement a calculator that takes an expression with digits, + and * and computes and prints its value.
7 & 8. Implement the front end of a compiler that generates the three address code for a simple language with: one data type integer, arithmetic operators, relational operators, variable declaration statement, one conditional construct, one iterative construct and assignment statement.
9 &10. Implement the back end of the compiler which takes the three address code generated in problems 7 and 8, and produces the 8086 assembly language instructions that can be assembled and run using a 8086 assembler. The target assembly instructions can be simple move, add, sub, jump. Also simple addressing modes are used.

ECT071   **PROJECT WORK- I**   **L T P C**
                                                                       0 0 24 12
The project will be of one semester duration. The students will be sent to different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study they will have to carry out a research project related to the area of interest and submit a research project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce Examination.

SEMESTER VIII

ECT081   **TCP / IP DESIGN AND IMPLEMENTATION**   L   T   P   C
                                                                        3   0   0   3

UNIT I   INTRODUCTION   **9**
Internetworking concepts and architectural model- classful Internet address – CIDR-Subnetting
and Supernetting –ARP- RARP- IP – IP Routing –ICMP – Ipv6

UNIT II   TCP   **9**
Services – header – connection establishment and termination- interactive data flow- bulk data
flow- timeout and retransmission – persist timer - keepalive timer- futures and performance

UNIT III   IP IMPLEMENTATION   **9**
IP global software organization – routing table- routing algorithms-fragmentation and
reassembly- error processing (ICMP) –Multicast Processing (IGMP)

UNIT IV   TCP IMPLEMENTATION I   **9**
Data structure and input processing – transmission control blocks- segment format-
comparison-finite state machine implementation-Output processing- mutual exclusion-
computing the TCP data length

UNIT V   TCP IMPLEMENTATION II   **9**
Timers-events and messages- timer process- deleting and inserting timer event- flow control
and adaptive retransmission-congestion avoidance and control – urgent data processing and
push function.

                                                                        TOTAL : 45 PERIODS
REFERENCES:
   1. Douglas E.Comer – "Internetworking with TCP/IP Principles, Protocols and Architecture",
      Vol. 1 & 2 fourth edition, Pearson Education Asia, 2003
   2. (Unit I in Comer Vol. I, Units II, IV & V – Comer Vol. II)
   3. W.Richard Stevens "TCP/IP illustrated" Volume 1 Pearson Education, 2003 (Unit II)
   4. TCP/IP protocol suite, Forouzan, 2nd edition, TMH, 2003
   5. W.Richard Stevens "TCP/IP illustrated" Volume 2 Pearson Education 2003.

ECT082   **XML AND WEB SERVICES**   L   T   P   C
                                                                        3   0   0   3

UNIT I INTRODUCTION   **9**
Role Of XML – XML and The Web – XML Language Basics – SOAP – Web Services –
Revolutions Of XML – Service Oriented Architecture (SOA).

UNIT II XML TECHNOLOGY   9
XML – Name Spaces – Structuring With Schemas and DTD – Presentation Techniques – Transformation – XML Infrastructure.

UNIT III SOAP   9
Overview Of SOAP – HTTP – XML-RPC – SOAP: Protocol – Message Structure – Intermediaries – Actors – Design Patterns And Faults – SOAP With Attachments.

UNIT IV WEB SERVICES   9
Overview – Architecture – Key Technologies - UDDI – WSDL – ebXML – SOAP And Web Services In E-Com – Overview Of .NET And J2EE.

UNIT V XML SECURITY   9
Security Overview – Canonicalization – XML Security Framework – XML Encryption – XML Digital Signature – XKMS Structure – Guidelines For Signing XML Documents – XML In Practice.

TOTAL: 45 PERIODS

REFERENCES:

1. Frank. P. Coyle, XML, Web Services And The Data Revolution, Pearson Education, 2002.
2. Ramesh Nagappan , Robert Skoczylas and Rima Patel Sriganesh, " Developing Java Web Services", Wiley Publishing Inc., 2004.
3. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.
4. McGovern, et al., "Java Web Services Architecture", Morgan Kaufmann Publishers,2005.

ECT083	**C # AND . NET FRAMEWORK**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I INTRODUCTION TO C#   8
Introducing C#, Understanding .NET, Overview of C#, Literals, Variables, Data Types, Operators, Expressions, Branching, Looping, Methods, Arrays, Strings, Structures, Enumerations.

UNIT II OBJECT ORIENTED ASPECTS OF C#   9
Classes, Objects, Inheritance, Polymorphism, Interfaces, Operator Overloading, Delegates, Events, Errors and Exceptions.

UNIT III APPLICATION DEVELOPMENT ON .NET   8
Building Windows Applications, Accessing Data with ADO.NET.

UNIT IV WEB BASED APPLICATION DEVELOPMENT ON .NET   8
Programming Web Applications with Web Forms, Programming Web Services.

UNIT V THE CLR AND THE .NET FRAMEWORK   **12**

Assemblies, Versioning, Attributes, Reflection, Viewing MetaData, Type Discovery, Reflecting on a Type, Marshaling, Remoting, Understanding Server Object Types, Specifying a Server with an Interface, Building a Server, Building the Client, Using SingleCall, Threads.

TOTAL: 45 PERIODS

REFERENCES:

1. E. Balagurusamy, "Programming in C#", Tata McGraw-Hill, 2004. (Unit I, II)
2. J. Liberty, "Programming C#", 2nd ed., O'Reilly, 2002. (Unit III, IV, V)
3. Herbert Schildt, "The Complete Reference: C#", Tata McGraw-Hill, 2004.
4. Robinson et al, "Professional C#", 2nd ed., Wrox Press, 2002.
5. Andrew Troelsen, "C# and the .NET Platform", A! Press, 2003.
6. S. Thamarai Selvi, R. Murugesan, "A Textbook on C#", Pearson Education, 2003.

ECT085	**TCP/IP DESIGN AND IMPLEMENTATION LAB**	**L**	**T**	**P**	**C**
		0	**0**	**3**	**2**

Hardware program
1. Design the Cross over and Rollover cable.
2. Create different topologies.

Socket Program
1. Looking up Internet Addresses.
2. Testing the characteristics of an IP address.
3. Write a program to trace the port of a particular host.
4. Write a program to implement the daytime protocol.
5. Write a program to implement the echo client.
6. Write a program to implement the finger client.
7. Write a program to implement the whois client.
8. Demonstration of TCP/IP protocol.
9. Demonstration of UDP protocol.
10. Implement a chat server using TCP/IP protocol.

Router Configuration (Commands)
1. IOS User modes- User mode and Privileged mode
2. Setting router name, setting up System Prompt.
3. Enable the password, Mapping hostname to IP address
4. Setting the routers time

ECT086   **C# AND .NET LAB**   **L   T   P   C**
                                                                               0   0   3   2

1. Creation of Windows form using C#.NET
2. Use Visual Studio's class library template to implement a class named Response. Response has one instance variable of type string and named resp. This is initialised to "Message 1: This is the first message". In addition to a constructor New, Response has one accessor method, getResp( ) which delivers the value of resp.
3. Write a program in C#.NET to present the histogram in a Word document.
4. Develop a database access class. This class should abstract all the methods required to access your database. You should only need to pass in the parameters or CRUD statement. There should be four methods:
   - getDataReader(String) <--- returns only a IDataReader
   - getDataSet(String) <---- returns a dataset
   - getDataSet(String()) <---- returns a dataset
   - executeNoReturnQuery(String) <---- returns true or false after performing
   - a Update, Delete, or Insert . Create testcases for each method. Remember,
   - Right BICEP.
5. Create the client SDI portion of the project. You task is to create the chat client portionof the project.

ECT091   **OPEN SOURCE SYSTEMS**   **L   T   P   C**
                                                                               3   1   0   4

UNIT I   **9**
Overview of Free/Open Source Software-- Definition of FOSS & GNU, History of GNU/Linux and the Free Software Movement , Advantages of Free Software and GNU/Linux, FOSS usage , trends and potential—global and Indian.GNU/Linux OS installation-- detect hardware, configure disk partitions & file systems and install a GNU/Linux distribution ; Basic shell commands - logging in, listing files, editing files, copying/moving files, viewing file contents, changing file modes and permissions, process management ; User and group management, file ownerships and permissions, PAM authentication ; Introduction to common system configuration files & log files ; Configuring networking, basics of TCP/IP networking and routing, connecting to the Internet (through dialup, DSL, Ethernet, leased line).

UNIT II   **9**
Configuring additional hardware - sound cards, displays & display cards, network cards, modems, USB drives, CD writers ; Understanding the OS boot up process; Performing everyday tasks using gnu/Linux -- accessing the Internet, playing music, editing documents and spreadsheets, sending and receiving email, copy files from disks and over the network, playing games, writing CDs ; X Window system configuration and utilities -- configure X windows, detect display devices ; Installing software -- from source code as well as using binary packages. Setting up email servers-- using postfix (SMTP services), courier   (IMAP & POP3 services), squirrel mail (web mail services) ; Setting up web servers -- using apache (HTTP services), php (server-side scripting), perl (CGI support) ; Setting up file services -- using samba (file and authentication services for windows networks), using NFS (file services for gnu/Linux / Unix networks) ; Setting up proxy services -- using squid (http / ftp / https proxy services) ; Setting up printer services - using CUPS (print spooler), foomatic (printer database)

UNIT III   **9**

Setting up a firewall - Using netfilter and ip tables; Using the GNU Compiler Collection –GNU compiler tools; the C preprocessor (cpp), the C compiler (gcc) and the C++ compiler (g++), assembler (gas) ; Understanding build systems -- constructing make files and using make, using autoconf and autogen to automatically generate make files tailored for different development environments ; Using source code versioning and management tools -- using CVS to manage source code revisions, patch & diff.

UNIT IV   **9**

Understanding the GNU Libc libraries and linker -- linking against object archives (.a libraries) and dynamic shared object libraries (.so libraries), generating statically linked binaries and libraries, generating dynamically linked libraries ; Using the GNU debugging tools -- gdb to debug programs, graphical debuggers like ddd, memory debugging / profiling libraries mpatrol and valgrind ; Review of common programming practices and guidelines for GNU/Linux and FOSS ; Introduction to Bash, sed & awk scripting. Basics of the X Windows server architecture.

UNIT V   **9**

Basics of the X Windows server architecture ; Qt Programming ; Gtk+ Programming ; Python Programming ; Programming GUI applications with localization support.

T: 15 TOTAL: 60 PERIODS

REFERENCES:

1. N. B. Venkateshwarlu (Ed); Introduction to Linux: Installation and Programming, B S Publishers; 2005.
2. Matt Welsh, Matthias Kalle Dalheimer, Terry Dawson, and Lar Kaufman, Running Linux, Fourth Edition, O'Reilly Publishers, 2002.
3. Carla Schroder, Linux Cookbook, First Edition, O'Reilly Cookbooks Series, 2004 On-line material
4. Open Sources: Voices from the Open Source Revolution, First Edition, January 1999, ISBN: 1-56592-582-3. URL: http://www.oreilly.com/catalog/opensources/book/toc.html
5. The Linux Cookbook: Tips and Techniques for Everyday Use, First Edition, Michael Stutz, 2001. URL: http://dsl.org/cookbook/cookbook_toc.html
6. The Linux System Administrators' Guide, Lars Wirzenius, Joanna Oja, Stephen Stafford, and Alex Weeks, December 2003. URL: http://www.tldp.org/guides.html
7. Using GCC, Richard Stallman et al. URL: http://www.gnu.org/doc/using.html
8. An Introduction to GCC, Brian Gough. URL: http://www.network-theory.co.uk/docs/gccintro/
9. GNU Autoconf, Automake and Libtool, Gary V. Vaughan, Ben Elliston, Tom Tromey and Ian Lance Taylor. URL: http://sources.redhat.com/autobook/
10. Open Source Development with CVS, Third Edition, Karl Fogel and Moshe Bar. URL: http://cvsbook.red-bean.com/
11. Advanced Bash Scripting Guide, Mendel Cooper, June 2005. URL: http://www.tldp.org/guides.html
12. GTK+/GNOME Application Development, Havoc Pennington. URL: http://developer.gnome.org/doc/GGAD
13. Python Tutorial, Guido van Rossum, Fred L. Drake, Jr., Editor. URL: http://www.python.org/doc/current/tut/tut.html

ECT092   **COMPONENT BASED TECHNOLOGY**   **L T P C**
                                                                     3 0 0 3

UNIT I   INTRODUCTION   9
Software Components – objects – fundamental properties of Component technology – modules – interfaces – callbacks – directory services – component architecture – components and middleware

UNIT II   JAVA BASED COMPONENT TECHNOLOGIES   9
Threads – Java Beans – Events and connections – properties – introspection – JAR files – reflection – object serialization – Enterprise Java Beans – Distributed Object models – RMI and RMI-IIOP

UNIT III   CORBA COMPONENT TECHNOLOGIES   9
Java and CORBA – Interface Definition language – Object Request Broker – system object model – portable object adapter – CORBA services – CORBA component model – containers – application server – model driven architecture

UNIT IV   . NET BASED COMPONENT TECHNOLOGIES   9
COM – Distributed COM – object reuse – interfaces and versioning – dispatch interfaces – connectable objects – OLE containers and servers – Active X controls – .NET components - assemblies – appdomains – contexts – reflection – remoting

UNIT V   COMPONENT FRAMEWORKS AND DEVELOPMENT   9
Connectors – contexts – EJB containers – CLR contexts and channels – Black Box component framework – directory objects – cross-development environment – component-oriented programming – Component design and implementation tools – testing tools - assembly tools

                                                        TOTAL: 45 PERIODS
REFERENCES:
1. Sudha Sadasivam, "Component-based Technology", Wiley India, 2008.
2. Clemens Szyperski, "Component Software: Beyond Object-Oriented Programming", Pearson   Education publishers, 2003
3. Ed Roman, "Mastering Enterprise Java Beans", John Wiley & Sons Inc., 1999.
4. Mowbray, "Inside CORBA", Pearson Education, 2003.
5. Hortsamann, Cornell, "CORE JAVA Vol-II" Sun Press, 2002

ECT093   **MIDDLEWARE TECHNOLOGIES**   **L T P C**
                                                                     3 0 0 3

UNIT I   INTRODUCTION   9
Client-server system architecture- Multi tier system architectures- File Server- Database Server, Group Server - Object Server- Web Server- Distributed object systems - Role of Middleware- Service Specific Middleware - Message Oriented Middleware - Object Middleware - Remote Procedure Call (RPC) Middleware- Database Middleware- Transaction Middleware- Portals- Embedded Middleware- Content-Centric Middleware– Peer to Peer.

UNIT II   MIDDLEWARE PRINCIPLES   9
Services and Interfaces - Architectural Patterns - Patterns for Distributed Object Middleware - Achieving Adaptability and Separation of Concerns - Naming and Binding - Names - Patterns for Distributed Name Services - Binding - Communication system for middleware.

UNIT III   OBJECT MIDDLEWARE   9
Java RMI - J2EE Framework - Overview of EJB - Session Bean- Entity Bean- CORBA Architecture - COM/DCOM - Application deployment using RMI, EJB, CORBA and COM - .NET Framework.

UNIT IV   WEB SERVICES TECHNOLOGIES   9
XML Technologies - DTD - XSD - XSLT - XQUERY - XPATH - DOM- SAX - Web Services (WS)- WSDL- SOAP - UDDI - WS Standards - WS Coordination and Transaction - Business Process Execution Language for Web Services (BPEL4WS).

UNIT V   MIDDLEWARE SECURITY   9
Introduction - Java security features - Java Authentication and Authorization services - J2EE Security capabilities - Security in CORBA - security services in CORBAS - .NET Security - Role Based Access Control - Access control policies - Advanced Topics.

                                                           TOTAL: 45 PERIODS

REFERENCES
1. Sacha Krakowiak, "Middleware Architecture with Patterns and Frameworks", 2009.
2. Qusay H. Mahmoud, "Middleware for Communications", WILEY publications, 2004.
3. Judith M. Myerson,"The Complete Book of Middleware", Auerbach Publications, 2002.
4. Ron Schmelzer ,"XML and Web Services Unleashed", Sams; 2002.

ECT095   OPEN SOURCE SYSTEMS LABORATORY   L T P C
                                                                   0 0 3 2

1. **Kernel** configuration, compilation and installation : Download / access the latest kernel source code from kernel.org,compile the kernel and install it in the local system.Try to view the source code of the kernel
2. **Virtualisation** environment (e.g., xen, kqemu or lguest) to test an applications, new kernels and isolate applications. It could also be used to expose students to other alternate OSs like *BSD
3. **Compiling from source** : learn about the various build systems used like the auto* family, cmake, ant etc. instead of just running the commands. This could involve the full process like fetching from a cvs and also include autoconf, automake etc.,

4. Introduction to **packet management system** : Given a set of RPM or DEB, how to build and maintain, serve packages over http or ftp. and also how do you configure client systems to access the package repository.

5. **Installing various software packages** Either the package is yet to be installed or an older version is existing. The student can practice installing the latest version. Of course, this might need internet access.
   Install samba and share files to windows
   Install Common Unix Printing System(CUPS)

6. **Write userspace drivers using fuse** — easier to debug and less dangerous to the system (Writing full-fledged drivers is difficult at student level)

7. **GUI programming** : a sample programme – using Gambas since the students have VB knowledge. However, one should try using GTK or QT

8. **Version Control System** setup and usage using RCS, CVS, SVN

9. **Text processing with Perl**: simple programs, connecting with database e.g., MYSQL

10. **Running PHP** : simple applications like login forms after setting up a LAMP stack

11. **Running Python** : some simple exercise – e.g. Connecting with MySql database

12. **Set up the complete network** interface usinf ifconfig command liek setting gateway, DNS, IP tables, etc.,

ECT096	COMPONENT BASED TECHNOLOGY LABORATORY	L	T	P	C
		0	0	3	2

1. Create a distributed application to download various files from various servers using RMI

2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK

3. Develop an Enterprise Java Bean for Banking operations

4. Develop an Enterprise Java Bean for Library operations

5. Create an Active-X control for File operations

6. Develop a component for converting the currency values using COM / .NET

7. Develop a component for encryption and decryption using COM / .NET

8. Develop a component for retrieving information from message box using DCOM /.NET

9. Develop a middleware component for retrieving Stock Market Exchange information using CORBA

10. Develop a middleware component for retrieving Weather Forecast information using CORBA

ECT0101   **PROJECT WORK- II**   **L T P C**
                                                                                             0 0 24 12

The project will be of one semester duration. The students will be sent to different organizations involved in science communication activities as per interest and specialization of students, mostly located in the place of the study they will have to carry out a research project related to the area of interest and submit a research project report at the end of the semester. The students shall defend their dissertation in front of experts during viva-voce Examination.

LIST OF ELECTIVES

ECT501	**PROFESSIONAL ETHICS**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT – I ENGINEERING ETHICS
9

Senses of 'engineering ethics' – variety of moral issues – types of inquiry – moral dilemmas – moral autonomy – kohlberg's theory – gilligan's theory – consensus and controversy – professions and professionalism – professional ideals and virtues – theories about right action – self-interest – customs and religion – uses of ethical theories.

UNIT – II ENGINEERING AS SOCIAL EXPERIMENTATION
9

Engineering as experimentation – engineers as responsible experimenters – codes of ethics – a balanced outlook on law – the challenger case study.

UNIT – III ENGINEER'S RESPONSIBILITY FOR SAFETY
9

Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk – the three mile island and chernobyl case studies.

UNIT – IV RESPONSIBILITIES AND RIGHTS
9

Collegiality and loyalty – respect for authority – collective bargaining – confidentiality – conflicts of interest – occupational crime – professional rights – employee rights – intellectual property rights (ipr) – discrimination

UNIT – V GLOBAL ISSUES
9

Multinational corporations – environmental ethics – computer ethics – weapons development – engineers as managers – consulting engineers – engineers as expert witnesses and advisors – moral leadership – sample code of conduct

TOTAL : 45

REFERENCES:

1. Mike Martin and Roland Schinzinger, "Ethics in Engineering", McGraw Hill, New York, 1996.
2. Charles D Fleddermann, "Engineering Ethics", prentice Hall, New Mexico, 1999.
3. Laura Schlesinger, "How Could You Do That: The Abdication of Character, Courage, and Conscience", Harper Collins, New York, 1996.
4. Stephen Carter, "Integrity", Basic Books, New York, 1996.
5. Tom Rusk, "The Power of Ethical Persuasion: From Conflict to Partnership at Work and in Private Life", Viking, New York, 1993

ECT502   **PRINCIPLES OF DATA COMMUNICATION**   L   T   P   C
                                                                            3   0   0   3

UNIT I BASICS OF COMMUNICATION   9

Basics of AM, FM and PM Block Diagram, Concepts of AM, FM modulators and demodulators - Pulse modulation systems - Pulse amplitude modulation - Sampling, Quantisation, Quantisation error.

UNIT II INFORMATION THEORY & CODING   9

Discrete Messages - Concepts of entropy and information rate - Shannon's theorem - channel capacity - Orthogonal signals and their use - Introduction to coding - Coding and Decoding - Algebraic codes, burst error correction codes - Convolution coding and decoding .

UNIT III DATA TRANSMISSION CONCEPTS   9

Concepts and Terminology- Analog and Digital transmission, Transmission impairments - Transmission media - Synchronous/Asynchronous transmission - Line Configurations - interfacing.

UNIT IV DATA ENCODING   9

Digital data Digital signals - Variations of NRZ and biphase - Digital data Analog signals - ASK, FSK, PSK, QPSK - Analog Data Digital signals - PCM,DM.

UNIT V DATA LINK CONTROL   9

Flow control, Error control - HDLC, Multiplexing.

                                                                            TOTAL: 45

REFERENCES:

1. Taub and Schilling, "Principles of Communication Systems", Tata Mc Graw Hill Pub. Co., New Delhi, 2002.

2. William Stallings, "Data and Computer Communications", Sixth Edition, Pearson Education, Prentice Hall of India, New Delhi, 2002.

3. Prakash C. Gupta, "Data Communications", Prentice Hall of India, New Delhi, 2002

ECT503   **MANAGEMENT INFORMATION SYSTEMS**   **L   T   P   C**
                                                                      4   0   0   4

UNIT I INTRODUCTION   **12**
Overview – Structure of MIS – Survey of Information System Technology – Hardware, Software and Communication or Information – Storage and Retrieval of Data – Transactions Processing , Office Automation and Information Processing Control Function.

UNIT II CONCEPTIONAL FOUNDATIONS   **12**
Design making Process – Concept of Information – Human as Information Processors – System Concepts – Concepts of Planning and Control – Organizational Structure and Management Concepts.

UNIT III INFORMATION BASED SUPPORT SYSTEMS   **12**
Support System for Planning , Control and Decision making – Support System for Management for Knowledge work – Decision Support Systems.

UNIT IV INFORMATION SYSTEM REQUIREMENTS   **12**
Developing a long range Information System – Plan Strategies for the determination of Information requirement – Database requirement – User interface requirements.

UNIT V DEVELOPMENT, IMPLEMENTATION AND MANAGEMENT OF INFORMATION SYSTEM RESOURCES   **12**
Developing and Implementing Application Systems – Quality Assurance and Evaluation of Information Systems – Organization and Management of the Information Resources – Further Development and their Organizational and Social Implications

                                                          TOTAL: 60

REFERENCES:
1. Gordan B Davis and Megrette H Olson, "Management Information Systems", McGraw Hill,1997
2. Murdick and Ross, "Information System for Modern Management", Prentice Hall of India, 1997.
3. David Kroenke, "Management Information Systems", McGraw Hill International Editions, 1989.

ECT504   **NETWORK SECURITY**   **L   T   P   C**
                                                                3   0   0   3

UNIT I INTRODUCTION   9
Attacks - Services - Mechanisms - Conventional Encryption - Classical and Modern Techniques – Encryption Algorithms - Confidentiality.

UNIT II PUBLIC KEY ENCRYPTION   9
RSA - Elliptic Curve Cryptography - Number Theory Concepts

UNIT III MESSAGE AUTHENTICATION   9
Hash Functions - Digest Functions - Digital Signatures - Authentication Protocols.

UNIT IV NETWORK SECURITY PRACTICE   9
Authentication, Applications - Electronic Mail Security - IP Security - Web Security.

UNIT V SYSTEM SECURITY   9
Intruders – Viruses – Worms – Firewalls Design Principles – Trusted Systems.

                                                                    TOTAL: 45

REFERENCES:

1. Stallings, Cryptography & Network Security - Principles & Practice, Prentice Hall, 3rd Edition 2002.
2. Bruce, Schneier, Applied Cryptography, 2nd Edition, Toha Wiley & Sons, 1996.
3. Man Young Rhee, "Internet Security", Wiley, 2003.
4. Pfleeger & Pfleeger, "Security in Computing", Pearson Education, 3rd Edition, 2003.

ECT505   **IMAGE PROCESSING**   **L   T   P   C**
                                                                3   0   0   3

UNIT I   DIGITAL IMAGE FUNDAMENTALS AND TRANSFORMS   9
Elements of visual perception – Image sampling and quantization Basic relationship between pixels – Basic geometric transformations-Introduction to Fourier Transform and DFT – Properties of 2D Fourier Transform – FFT – Separable Image Transforms -Walsh – Hadamard – Discrete Cosine Transform, Haar, Slant – Karhunen – Loeve transforms.

UNIT II   IMAGE ENHANCEMENT TECHNIQUES   9
Spatial Domain methods: Basic grey level transformation – Histogram equalization – Image subtraction – Image averaging –Spatial filtering: Smoothing, sharpening filters – Laplacian filters – Frequency domain filters : Smoothing – Sharpening filters – Homomorphic filtering.

UNIT III IMAGE RESTORATION: 9

Model of Image Degradation/restoration process – Noise models – Inverse filtering -Least mean square filtering – Constrained least mean square filtering – Blind image restoration – Pseudo inverse – Singular value decomposition.

UNIT IV IMAGE COMPRESSION   9

Lossless compression: Variable length coding – LZW coding – Bit plane coding- predictive coding-DPCM.
Lossy Compression: Transform coding – Wavelet coding – Basics of Image compression standards: JPEG, MPEG,Basics of Vector quantization.

UNIT V IMAGE SEGMENTATION AND REPRESENTATION   9

Edge detection –Thresholding - Region Based segmentation – Boundary representation: chair codes- Polygonal approximation –Boundary segments –boundary descriptors: Simple descriptors-Fourier descriptors - Regional descriptors –Simple descriptors- Texture

TOTAL : 45

REFERENCES:

1. Rafael C Gonzalez, Richard E Woods 2nd Edition, Digital Image Processing - Pearson Education 2003.
2. William K Pratt, Digital Image Processing John Willey (2001)
3. Image Processing Analysis and Machine Vision – Millman Sonka, Vaclav hlavac, Roger Boyle, Broos/colic, Thompson Learniy (1999).
4. A.K. Jain, PHI, New Delhi (1995)-Fundamentals of Digital Image Processing.
5. Chanda Dutta Magundar – Digital Image Processing and Applications, Prentice Hall of India, 2000

ECT506	ADVANCED DBMS	L	T	P	C
		3	0	0	3

UNIT I DATABASE MANAGEMENT   9

Relational Data Model – SQL - Database Design - Entity-Relationship Model – Relational Normalization – Embedded SQL – Dynamic SQL – JDBC – ODBC.

UNIT II ADVANCED DATABASES   10

Object Databases - Conceptual Object Data Model – XML and Web Data – XML Schema – Distributed Data bases – OLAP and Data Mining – ROLAP and MOLAP

UNIT III QUERY AND TRANSACTION PROCESSING   8

Query Processing Basics – Heuristic Optimization – Cost, Size Estimation - Models of Transactions – Architecture – Transaction Processing in a Centralized and Distributed System – TP Monitor.

UNIT IV   IMPLEMENTING AND ISOLATION   **9**

Schedules – Concurrency Control – Objects and Semantic Commutativity – Locking – Crash, Abort and Media Failure – Recovery – Atomic Termination – Distributed Deadlock – Global Serialization – Replicated Databases – Distributed Transactions in Real World.

UNIT V   DATABASE DESIGN ISSUES   **9**

Security – Encryption – Digital Signatures – Authorization – Authenticated RPC - Integrity - Consistency - Database Tuning - Optimization and Research Issues.

                                                                            TOTAL: 45

REFERENCES:

1. Philip M. Lewis, Arthur Bernstein, Michael Kifer, "Databases and Transaction Processing: An Application-Oriented Approach", Addison-Wesley, 2002
2. R. Elmasri and S.B. Navathe, Fundamentals of Database Systems, 3rd Edition, Addison Wesley, 2004
3. Abraham Silberschatz, Henry. F. Korth, S.Sudharsan, Database System Concepts, 4th Edition., Tata McGraw Hill, 2004
4. Raghu Ramakrishnan & Johannes Gehrke, "Database Management Systems", 3rd Edition, TMH, 2003

ECT507	SOFTWARE PROJECT MANAGEMENT	L	T	P	C
		3	0	0	3

UNIT I   SINTRODUCTION TO SOFTWARE PROJECT MANAGEMENT   **9**

Project Definition – Contract Management – Activities Covered by Software Project Management – Overview Of Project Planning – Stepwise Project Planning.

UNIT II   PROJECT EVALUATION   **9**

Strategic Assessment – Technical Assessment – Cost Benefit Analysis – Cash Flow Forecasting – Cost Benefit Evaluation Techniques – Risk Evaluation. – Software effort estimation

UNIT III   ACTIVITY PLANNING   **9**

Objectives – Project Schedule – Sequencing and Scheduling Activities – Network Planning Models – Forward Pass – Backward Pass – Activity Float – Shortening Project Duration – Activity on Arrow Networks – Risk Management – Nature Of Risk – Types Of Risk – Managing Risk – Hazard Identification – Hazard Analysis – Risk Planning and Control.

UNIT IV   MONITORING AND CONTROL   **9**

Resource allocation - identifying and scheduling resources – publishing resource and cost schedule – scheduling sequence - Creating Framework – Collecting The Data – Visualizing Progress – Cost Monitoring – Earned Value – Priortizing Monitoring – Getting Project Back To Target – Change Control – Managing Contracts – Introduction – Types Of Contract – Stages In Contract Placement – Typical Terms Of A Contract – Contract Management – Acceptance.

UNIT V   MANAGING PEOPLE AND ORGANIZING TEAMS   9

Introduction – Understanding Behavior – Organizational Behaviour - Selecting The Right Person For The Job – Instruction In The Best Methods – Motivation – The Oldman – Hackman Job Characteristics Model – Working In Groups – Becoming A Team – Decision Making – Leadership – Organizational Structures – Stress – Health And Safety – Case Studies.

TOTAL:45

REFERENCES:

1. Bob Hughes, Mikecotterell, "Software Project Management", Third Edition,Tata McGraw Hill, 2004.
2. Ramesh, Gopalaswamy, "Managing Global Projects", Tata McGraw Hill,2001.
3. Royce, "Software Project Management", Pearson Education, 1999.
4. Jalote, "Software Project Management in Practice", Pearson Education,2002.
5. Robert T. Futrell, Donald F. Shefer and Linda I. Shefer, "Quality Software Project Management", Pearson Education, 2003

ECT508	MOBILE COMPUTING	L	T	P	C
		3	0	0	3

UNIT I   WIRELESS COMMUNICATION FUNDAMENTALS   9

Introduction – Wireless transmission – Frequencies for radio transmission – Signals – Antennas – Signal Propagation – Multiplexing – Modulations – Spread spectrum – MAC – SDMA – FDMA – TDMA – CDMA – Cellular Wireless Networks.

UNIT II   TELECOMMUNICATION NETWORKS   11

Telecommunication systems – GSM – GPRS – DECT – UMTS – IMT-2000 – Satellite Networks - Basics – Parameters and Configurations – Capacity Allocation – FAMA and DAMA – Broadcast Systems – DAB - DVB.

UNIT III   WIRLESS LAN   9

Wireless LAN – IEEE 802.11 - Architecture – services – MAC – Physical layer – IEEE 802.11a - 802.11b standards – HIPERLAN – Blue Tooth.

UNIT IV   MOBILE NETWORK LAYER   9

Mobile IP – Dynamic Host Configuration Protocol - Routing – DSDV – DSR – Alternative Metrics.

UNIT V   TRANSPORT AND APPLICATION LAYERS   7

Traditional TCP – Classical TCP improvements – WAP, WAP 2.0.

TOTAL: 45

REFERENCES:

1. Jochen Schiller, "Mobile Communications", PHI/Pearson Education, Second Edition, 2003. (Unit I Chap 1,2 &3- Unit II chap 4,5 &6-Unit III Chap 7.Unit IV Chap 8- Unit V Chap 9&10.)
2. William Stallings, "Wireless Communications and Networks", PHI/Pearson Education, 2002. (Unit I Chapter – 7&10-Unit II Chap 9)
3. Kaveh Pahlavan, Prasanth Krishnamoorthy, "Principles of Wireless Networks", PHI/Pearson Education, 2003.
2. Uwe Hansmann, Lothar Merk, Martin S. Nicklons and Thomas Stober, "Principles of Mobile Computing", Springer, New York, 2003.

ECT509	SERVICE ORIENTED ARCHITECTURE	L	T	P	C
		3	0	0	3

UNIT I 9

Introduction – Service Oriented Enterprise – Service Oriented Architecture (SOA) – SOA and Web Services – Multi-Channel Access – Business Process management – Extended Web Services Specifications – Overview of SOA – Concepts – Key Service Characteristics – Technical Benefits – Business Benefits

UNIT II 9

SOA and Web Services – Web Services Platform – Service Contracts – Service-Level Data Model – Service Discovery – Service-Level Security – Service-Level Interaction patterns – Atomic Services and Composite Services – Proxies and Skeletons – Communication – Integration Overview – XML and Web Services - .NET and J2EE Interoperability – Service-Enabling Legacy Systems – Enterprise Service Bus Pattern

UNIT III 9

Multi-Channel Access – Business Benefits – SOA for Multi Channel Access – Tiers – Business Process Management – Concepts – BPM, SOA and Web Services – WS-BPEL – Web Services Composition

UNIT IV 9

Java Web Services – JAX APIs – JAXP – JAX-RPC – JAXM – JAXR – JAXB

UNIT V 9

Metadata Management – Web Services Security – Advanced Messaging – Transaction Management

TOTAL:45

REFERENCES:

1. Eric Newcomer, Greg Lomow, "Understanding SOA with Web Services", Pearson Education, 2005
2. James McGovern, Sameer Tyagi, Michael E Stevens, Sunil Mathew, "Java Web Services Architecture", Elsevier, 2003. (Unit 4)
3. Thomas Erl, "Service Oriented Architecture", Pearson Education, 2005
4. Frank Cohen, "FastSOA", Elsevier, 2007.
5. Jeff Davies, "The Definitive Guide to SOA", Apress, 2007.
6. Sandeep Chatterjee, James Webber, "Developing Enterprise Web Services", Pearson Education, 2004.

ECT510	GRID COMPUTING	L	T	P	C
		3	0	0	3

UNIT I   GRID COMPUTING   9

Introduction - Definition - Scope of grid computing

UNIT II   GRID COMPUTING INITIATIVES   9

Grid Computing Organizations and their roles – Grid Computing analog – Grid Computing road map.

UNIT III   GRID COMPUTING APPLICATIONS   9

Merging the Grid sources – Architecture with the Web Devices Architecture.

UNIT IV   TECHNOLOGIES   9

OGSA – Sample use cases – OGSA platform components – OGSI – OGSA Basic Services.

UNIT V   GRID COMPUTING TOOL KITS   9

Globus Toolkit – Architecture, Programming model, High level services – OGSI .Net middleware Solutions.

TOTAL: 45

REFERENCES:

1. Joshy Joseph & Craig Fellenstein, "Grid Computing", PHI, PTR-2003.
2. Ahmar Abbas, "Grid Computing: A Practical Guide to technology and Applications", Charles River media – 2003.

ECT511   **BUSINESS DATA PROCESSING**   L   T   P   C
                                                                        3   0   0   3

UNIT I   INTRODUCTION   9
Organizational behaviour- Foundations of Individual behavior-Perception and Individual decision making-values, attitude and job satisfaction.

UNIT II   GROUPS IN ORGANISATION   9
Foundations of group behaviour- Understanding work teams- Communication –Leadership.

UNIT III   ORGANISATION SYSTEM   9
Foundations of organization structure – Technology – Work design and stress – Human resource policies and practices – Organisational Culture.

UNIT IV   BUSINESS PROCESS RE-ENGINEERING AND IT   9
Basic concepts and the need for BPR-Principles of BPR and the role of IT- BPR and restructuring the organization.

UNIT V   NETWORK ORGANIZATIONS   9
Networked organization- virtual corporations.
                                                                           TOTAL: 45
REFERENCES:
1. Stephen P.Robbins "Organizational behavior", PHI, 12th edition, 2006.
2. Turban,Mclean,wetherbe,"Information Technology for management" John Wiely and Sons, 2001.
3. Ravi Kalakota and Marcia Robinson, "E-Business; Roadmap for Success; Pearson Education, 2000.
4. Vikram Sethi & William R King, " Organizational transformation through business process reengineering", Pearson education, 2006.

ECT512   **PC TESTING AND TROUBLE SHOOTING**   L   T   P   C
                                                                        3   0   0   3

UNIT I   9
PC Hardware Introduction and Overview : Personal computing History, Types of systems, Documentation – Technical Reference Manuals – Hardware Maintenance Manuals.
System Teardown and Inspection : Hand Tools, Soldering and Desoldering Tools, Loop Back Connectors, Meters, Logic Probes and Logic Pulsers, Outlet Tester and Chemicals, Disassembly Procedures.

UNIT II 9

Primary System Components : Types of Motherboards, ROM BIOS Compatibility. Bus Slots and I/O Cards. The Processor Bus, the Memory Bus and the Address Bus, Expansion Slots. Types of I/O Buses : The ISA Bus, EISA Bus, VESA Bus and PCI Bus. I/O port Addresses and DMA Channels.

PC System Memory : Base Memory, Upper Memory Area, Extended Memory, Expanded Memory, Total Installed Memory Versus Total Usable Memory. Physical Memory and Testing Memory.

UNIT III 9

Floppy Disk Drives : Types of Floppy Drives, Handling Recording Problems, Analysis Floppy Disk Construction, Drive Installation Procedure Trouble Shooting and Correcting Problems, Repairing Floppy Drives.
Hard Disk Drives : Hard disk Interfaces and Installation procedure Hard Disk Trouble Shooting and Repair.

UNIT IV 9

System Assembly and Maintenance : System upgrades – Upgrades system Memory, Speeding up a system, upgrading the DOS Version.
Preventive Maintenance : Active and Passive Preventive Maintenance Procedure – Power – Protection Systems – Surge suppressions, Phone line surge protectors, Line conditioners, Backup Power, dedicated data backup hardware.

UNIT V 9

Software and Hardware Diagnostic Tools: The power On self test (POST), General purpose Diagnostic Programs – AMI Diag, Checkit Pro-Norton Diagnostics, Qaplus, Norton utilities, Anti-Virus Tools.
Operating System and Trouble Shooting : DOS Components, The Basic process, How DOS Loads and starts, File Management, DOS File spared allocation, The DEBUG Program, Memory Resident Software Conflicts.

TOTAL:45

REFERENCES:
1. Scott Mueller "Upgrading and Repairing PCs", 14th Edition, Pearson Education, New Delhi, 2002.
2. Govindaraju B. "IBM PC and Clones : Hardware, Trouble Shooting and Maintenance", 2nd Edition, Tata McGraw Hill Pub. Co., New Delhi, 2002.

ECT513	**NEURAL NETWORKS**	**L**	**T**	**P**	**C**
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UNIT I   INTRODUCTION TO NEURAL NETWORKS 9

Introduction, Humans and Computers, Organization of the Brain, Biological Neuron, Biological and Artificial Neuron Models, Characteristics of ANN, McCulloch-Pitts Model, Historical Developments, Potential Applications of ANN.

UNIT II　　　**ESSENTIALS OF ARTIFICIAL NEURAL NETWORKS**　　　**9**

Artificial Neuron Model, Operations of Artificial Neuron, Types of Neuron Activation Function, ANN Architectures, Classification Taxonomy of ANN – Connectivity, Learning Strategy (Supervised, Unsupervised, Reinforcement), Learning Rules.

UNIT III　　　**SINGLE LAYER FEED FORWARD NEURAL NETWORKS**　　　**9**

Introduction, Perceptron Models: Discrete, Continuous and Multi-Category, Training Algorithms: Discrete and Continuous Perceptron Networks, Limitations of the Perceptron Model.

UNIT IV　　　**MULTILAYER FEED FORWARD NEURAL NETWORKS**　　　**9**

Credit Assignment Problem, Generalized Delta Rule, Derivation of Backpropagation (BP) Training, Summary of Backpropagation Algorithm, Kolmogorov Theorem, Learning Difficulties and Improvements.

UNIT V　　　**APPLICATIONS**　　　**9**

Neural network applications: Process identification, control, fault diagnosis. Fuzzy logic applications: Fuzzy logic control and Fuzzy classification.

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REFERENCES:

1. S. Rajasekharan and G. A. Vijayalakshmi pai, "Neural Networks, Fuzzy logic, Genetic algorithms:synthesis and applications", PHI Publication, 2004.
2. John Yen and Reza Langan, "Fuzzy Logic: Intelligence, Control and Information", Pearson Education,2004.
3. Simon Haykin, "Neural Networks- A comprehensive foundation", Pearson Education, 2001.
4. S.N.Sivanandam, S.Sumathi,S. N. Deepa "Introduction to Neural Networks using MATLAB 6.0", TMH, 2006.
5. James A Freeman and Davis Skapura, Neural Networks Pearson Education, 2002.
6. Timothy J. Ross, "Fuzzy Logic With Engineering Applications", McGraw-Hill Inc. 1997

ECT514	**FUZZY LOGIC**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I　　　**INTRODUCTION TO FUZZY LOGIC**　　　**9**

Fuzzy sets – fuzzy relations – fuzzy conditional statements – fuzzy rules – fuzzy algorithm.

UNIT II　　　**FUZZY LOGIC CONTROL SYSTEM**　　　**10**

Fuzzy logic controller – fuzzification interface – knowledge base – decision making logic – defuzzification interface – design of fuzzy logic controller – case study.

UNIT III   **INTRODUCTION AND DIFFERENT ARCHITECTURES OF NEURAL NETWORKS**   **9**

Artificial neuron – MLP – Back propagation – Hope field networks – Kohonen self-organising maps – adaptive resonance theory.

UNIT IV   NEURAL NETWORKS FOR CONTROL   10

Schemes of neuro-control – identification and control of dynamical systems – adaptive neuro controller – case study.

UNIT V   NEURO-FUZZY LOGIC CONTROL   7

Optimisation of membership function and rules base of fuzzy logic controller using neural networks – genetic algorithm – fuzz y neuron – adaptive fuzzy systems – case study.

TOTAL:45

REFERENCES:

1. Laurance Fausett, Fundamentals of Neural Networks, Prentice Hall, Englewood cliffs, N.J, 1992.
2. Zimmermann H.J., Fuzzy set theory and its applications, Allied Publication Ltd., 1996.
3. Tsoukalas L.H, and Robert E.Uhrig, Fuzzy and Neural approach in Engineering, John Wiley and Sons, 1997.
4. Jacek M.Zurada, Introduction to artificial Neural Systems, Jaico Publishing House Mumbai, 1997.

ECT515	**CLIENT SERVER COMPUTING**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I   9

Client/Server Computing: DBMS concept and architecture, Single system image, Client Server architecture, mainframe-centric client server computing, downsizing and client server computing, preserving mainframe applications investment through porting, client server development tools, advantages of client server computing.

UNIT II   9

Components of Client/Server application: The client: services, request for services, RPC, windows services, fax, print services, remote boot services, other remote services, Utility Services & Other Services, Dynamic Data Exchange (DDE), Object Linking and Embedding (OLE), Common Object Request Broker Architecture (CORBA).
The server: Detailed server functionality, the network operating system, available platforms, the network operating system, available platform, the server operating system.

UNIT III   9

Client/Server Network: connectivity, communication interface technology, Interposes communication, wide area network technologies, network topologies (Token Ring, Ethernet, FDDI, CDDI) network management, Client-server system development: Software, Client–Server System Hardware: Network Acquisition, PC-level processing unit, Macintosh, notebooks, pen, UNIX workstation, x-terminals, server hardware.

UNIT IV 9

Data Storage: magnetic disk, magnetic tape, CD-ROM, WORM, Optical disk, mirrored disk, fault tolerance, RAID, RAID-Disk network interface cards. Network protection devices, Power Protection Devices, UPS, Surge protectors.Client Server Systems Development: Services and Support, system administration, Availability, Reliability, Serviceability, Software Distribution, Performance, Network management, Help Disk, Remote Systems Management Security, LAN and Network Management issues.

UNIT V 9

Client/Server System Development: Training, Training advantages of GUI Application, System Administrator training, Database Administrator training, End-user training. The future of client server Computing Enabling Technologies, The transformational system.

TOTAL: 45

REFERENCES:

1. Patrick Smith & Steave Guengerich, "Client / Server Computing", PHI, 1994
2. Dawna Travis Dewire, "Client/Server Computing", TMH, 1993
3. Majumdar & Bhattacharya, "Database Management System", TMH
4. Korth, Silberchatz, Sudarshan, "Database Concepts", McGraw Hill, 6th ed, 2010
5. Elmasri, Navathe, S.B, "Fundamentals of Data Base System", Addison Wesley; 3rd edition,1999.

ECT516	INFORMATION SECURITY	L	T	P	C
		3	0	0	3

UNIT 1 INTRODUCTION 9

History, What is Information Security?, Critical Characteristics of Information, NSTISSC Security Model, Components of an Information System, Securing the Components, Balancing Security and Access, The SDLC, The Security SDLC

UNIT II SECURITY INVESTIGATION 9

Need for Security, Business Needs, Threats, Attacks, Legal, Ethical and Professional Issues

UNIT III SECURITY ANALYSIS 9

Risk Management: Identifying and Assessing Risk, Assessing and Controlling Risk

UNIT IV LOGICAL DESIGN 9

Blueprint for Security, Information Security Poicy, Standards and Practices, ISO 17799/BS 7799, NIST Models, VISA International Security Model, Design of Security Architecture, Planning for Continuity

UNIT V PHYSICAL DESIGN 9

Security Technology, IDS, Scanning and Analysis Tools, Cryptography, Access Control Devices, Physical Security, Security and Personnel

TOTAL: 45

REFERENCES:

1. Michael E Whitman and Herbert J Mattord, "Principles of Information Security", Vikas Publishing House, New Delhi, 2003
2. Micki Krause, Harold F. Tipton, " Handbook of Information Security Management", Vol 1-3 CRC Press LLC, 2004.
3. Stuart Mc Clure, Joel Scrambray, George Kurtz, "Hacking Exposed", Tata McGraw-Hill, 2003
4. Matt Bishop, " Computer Security Art and Science", Pearson/PHI, 2002.

ECT517	**ADVANCED OPERATING SYSTEMS**	**L**	**T**	**P**	**C**
		3	**0**	**0**	**3**

UNIT I 9

Architectures of Distributed Systems - System Architecture types - issues in distributed operating systems - communication networks – communication primitives. Theoretical Foundations - inherent limitations of a distributed system – lamp ports logical clocks – vector clocks – casual ordering of messages – global state – cuts of a distributed computation – termination detection. Distributed Mutual Exclusion – introduction – the classification of mutual exclusion and associated algorithms – a comparative performance analysis.

UNIT II 9

Distributed Deadlock Detection -Introduction - deadlock handling strategies in distributed systems – issues in deadlock detection and resolution – control organizations for distributed deadlock detection – centralized and distributed deadlock detection algorithms –hierarchical deadlock detection algorithms. Agreement protocols – introduction-the system model, a classification of agreement problems, solutions to the Byzantine agreement problem, applications of agreement algorithms. Distributed resource management: introduction-architecture – mechanism for building distributed file systems – design issues – log structured file systems.

UNIT III 9

Distributed shared memory-Architecture– algorithms for implementing DSM – memory coherence and protocols – design issues. Distributed Scheduling – introduction – issues in load distributing – components of a load distributing algorithm – stability – load distributing algorithm – performance comparison – selecting a suitable load sharing algorithm – requirements for load distributing -task migration and associated issues. Failure Recovery and Fault tolerance: introduction– basic concepts – classification of failures – backward and forward error recovery, backward error recovery- recovery in concurrent systems – consistent set of check points – synchronous and asynchronous check pointing and recovery – check pointing for distributed database systems- recovery in replicated distributed databases.

UNIT IV 9

Protection and security -preliminaries, the access matrix model and its implementations.-safety in matrix model- advanced models of protection. Data security – cryptography: Model of cryptography, conventional cryptography- modern cryptography, private key cryptography, data encryption standard- public key cryptography – multiple encryptions – authentication in distributed systems.

UNIT-V **9**

Multiprocessor operating systems - basic multiprocessor system architectures – inter connection networks for multiprocessor systems – caching – hypercube architecture. Multiprocessor Operating System - structures of multiprocessor operating system, operating system design issues- threads- process synchronization and scheduling.

Database Operating systems :Introduction- requirements of a database operating system Concurrency control : theoretical aspects – introduction, database systems – a concurrency control model of database systems- the problem of concurrency control – serializability theory-distributed database systems, concurrency control algorithms – introduction, basic synchronization primitives, lock based algorithms-timestamp based algorithms, optimistic algorithms – concurrency control algorithms, data replication.

TOTAL: 45

REFERENCES:

1. Mukesh Singhal, Niranjan G.Shivaratri, "Advanced concepts in operating systems: Distributed, Database and multiprocessor operating systems", TMH, 2001
2. Andrew S.Tanenbaum, "Modern operating system", PHI, 2003
3. Pradeep K.Sinha, "Distributed operating system-Concepts and design", PHI, 2003.
4. Andrew S.Tanenbaum, "Distributed operating system", Pearson education, 2003

ECT518	DECISION SUPPORT SYSTEM	L T P C
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UNIT I **9**

Concepts in general management – information systems – decision support systems.

UNIT II **9**

Database Management systems – Model Base Management Systems.

UNIT III **9**

Dialogue management subsystem – hardware and software technologies for DOS.

UNIT IV **9**

Artificial intelligence expert systems applied to DOS – Internet : the future of computing.

UNIT V **9**

Electronic data interchange – computer networks – example of a DSS software – interactive financial planning system (IFPS)

Total L : 45

TEXT BOOK

1. Janakiraman V.S. and Sarukesi, Decision Support System, Prentice Hall of India, New Delhi, 1999.

UNIT I   INTRODUCTION   9

Soft computing paradigms – Neural network – Fuzzy type – Derivation free optimization methods of genetics algorithms – Soft computing characteristics.

UNIT II   FUZZY LOGIC   9

Sets – Properties – Arithmetics - Members function – Fuzzy relations – Relation equations – Fuzzy measures – Types of uncertainty – Members of uncertainties – Measures of fuzziness – Probabilities Possibility – Measures of fuzzy events.

UNIT IV   NEURAL NETWORKS   9

Multi-level perception – Algorithms – Visualizing network behaviour – B:PN – Self organizing network – Kohenen algorithms – Hopfield network – Adaptive resonance theory – Pattern classification.

UNIT V   GENTIC ALGORITHMS   9

Introduction – Biological terminology – Search space and fitness landscapes – Elements of genetic algorithms – Genetic algorithms in problem solving.

UNIT III   NEURAL COMPUTING   9

Neuron modeling – Learning in Simple Neuron – Perception earning curve – Proof – Limitations of perception.

TEXT BOOKS

1.   Kauffmann. A., "Theory of Fuzzy Subsets", Academic Press, 1989.

2.   R.Beale C.T.Jacson, "Neural Computing- An introdution", Adam Hilger, 1990.

3.   Melanie Mitchell, "An Introduction to Genetic Algorithms", Prentice Hall of India, 1996.

REFERENCES

1.   J.S.Jang, C.T.Sun, E. Mizutani, "Neuro – Fuzzy and Soft Computing", Matlab Curriculam Series, Prentice International, 1997.

2.   Simon Havkin, "Neural Networks – A Comprehensive Foundation", Prentice Hall of Inda, 1994.

ECT520	**DISTRIBUTED OPERATING SYSTEM**	**L**	**T**	**P**	**C**
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UNIT I   **9**
Fundamentals – evolution – System Models – Distributed operating System – Issues – Distributed Computing environment Message passing – Introduction – Features – Issues – Synchronization – Buffering – Message – Encoding – Decoding – Process addressing – Failure Handling.

UNIT II   **9**
Remote Procedure calls – Introduction – Model – Transparency – Implementation – Stub Generation – Messages – Marshaling   Arguments and results –server Management – Parameter passing Semantics - Call Semantics – Communication Protocols – Complicated RPC's – Client – Server Binding – Exception handling – Security Distributed shared Memory – Introduction – Architecture – Issues – Granularity Structure – Consistency Models – Replacement Strategy – Thrashing.

UNIT III   **9**
Synchronization – Introduction – Clock Synchronization – Event ordering – Mutual Exclusion – Deadlock – Election Algorithms.

UNIT IV   **9**
Resource Management – Introduction – Features – Task Assignment approach – Load-Balancing Approach - Load -Sharing Approach Process Management – Introduction – Process Migration – Threads.

UNIT V   **9**
Distributed File Systems – Introduction – Features – File Models – Accessing Models – Sharing Semantics – Caching Schemes – File Replication – Fault Tolerance – Atomic Transactions – Design Principles Naming – Introduction – Features – Terminologies – Concepts.

                                                                                                    TOTAL: 45

REFERENCES:
1. Pradeep K. Sinha, "Distributed Operating Systems, Concepts and Design" Prentice Hall of India, New Delhi, 2001.
2. Andrew S. Tanenbaum "Distributed Operating Systems", Pearson Education, New Delhi, 2002
3. Mukesh Singhal and Nirajan G.Shivaratri "Advanced Concepts in Operating Systems", Tata McGraw Hill Publishing Company Ltd., New Delhi, 2001.

ECT521   **SOFTWARE DOCUMENTATION**   **L T P C**
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COURSE OBJECTIVES:
- Develop the knowledge and skills required to succeed as a technical communications professional.
- Learn to write and present information that is clear, concise and audience-focused.
- Focus on specialized communication formats including proposal writing, online documentation and technical manuals.

UNIT I   BASIC CONCEPTS   9
Importance of communication and documentation; Different types of communication; Spoken communication;written communication; Different types of documentation.

UNIT II   INDIVIDUAL COMMUNICATION   9
Elements of good individual communication - getting over nervousness - organizing one self - characteristics of effective communication - augmenting spoken words by actions and other means - other aspects of spoken communication like speeches; presentations; use of visual aids.

UNIT III   GROUP COMMUNICATION   9
Meeting - effective participation - effective management of meetings - preparing minutes - " virtual " meetings audio conference - video conference - use of collaboration tools.

UNIT IV   DIFFERENT TYPES OF DOCUMENTATION   9
Principles of effective written comminucation - differences between written communication and spoken communication - resume writing - e-mail; effective e-mail techniques - proposals - contracts - user guides external technical documentation for software - internal software technical documentation - users guides – letters and different types of letters -legal issues.

UNIT V   TECHNOLOGY AND STANDARDS   9
Use of various tools and technologies - need for standardization - role of processes and standards in documentation - on-line help - impact of Interent on documentation - common challenges in the harnessing of technology.

                                                            TOTAL : 45 PERIODS

TEXT BOOK
1.   Huckin, et al, " Technical Writing and Professional Communication ",McGraw Hill, 1991.
2.   W.R. Gordin and Edward W.Mammen: " The Art of Speaking Made Simple ",Rupa & Co., 1982.

REFERENCES
1. Ron Ludlow and Fergus Panton, " The Essence of Effective Communication ",PHI (P) Ltd., New   Delhi, 1995.
2. Sushil Bahl: " Business Communication Today ", Response Books, New Delhi, 1996.
3. Eyre, " Effective Communication Made Simple ", W.H. Allen, London, 1979.
4. Gloria Wilson and Garry Bitter, " Learning Media Design (Text and CD Rom) ", PHI (P)Ltd., New Delhi, 1998.
5. Simmon Collin - " Multimedia Made Simple ", Asian Books (P) New Delhi, 1996.