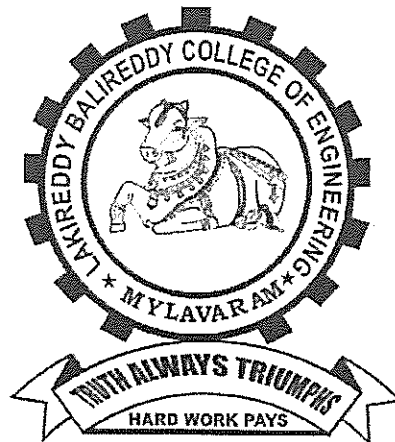# LAKIREDDY BALIREDDY
COLLEGE OF ENGINEERING
(AUTONOMOUS)
(Approved by AICTE, Affiliated to JNTUK, Accredited by NBA,
ISO 9001 : 2008 Certified & Accredited by **NAAC with "A" Grade)**

MASTER OF COMPUTER APPLICATIONS
(MCA)

(Applicable for the batches admitted from 20110-11)

L.B.Reddy Nagar :: Mylavaram – 521 230 :: Krishna District
ANDHRA PRADESH STATE

COURSE STRUCTURE

I – SEMESTER

| Code No. | Name of the Course | Scheme of Instruction | | | Scheme of Examination | | | Credits |
| | | Periods per Week | | | Maximum Marks | | | |
		Lectures	Tutorial	Lab.	Internal	External	Total	
MC101	Fundamentals of Computers and C - Programming	4	1	--	40	60	100	4
MC102	Digital Logic and Computer System Organization	4	--	--	40	60	100	4
MC103	Accounting and Financial Management	4	--	--	40	60	100	4
MC104	Discrete Structures and Graph Theory	4	--	--	40	60	100	4
MC105	Probability and Statistical Applications	4	--	---	40	60	100	4
MC106	English Language Communication Skills-I	2	--	2	40	60	100	3
MC151	Fundamentals of Computers and C - Programming Lab	--	--	4	40	60	100	2
MC152	Digital Logic and Computer System Organization Lab	--	--	4	40	60	100	2
MC153	Seminar	--	--	--	50	--	50	1
	TOTAL	22	01	10	370	480	850	28

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COURSE STRUCTURE

II – SEMESTER

| Code No. | Name of the Course | Scheme of Instruction | | | Scheme of Examination | | | | Credits |
| | | Periods per Week | | | Maximum Marks | | Total | | |
		Lectures	Tutorial	Lab.	Internal	External			
MC201	Data Structures	4	--	--	40	60	100	4
MC202	Database Management Systems	4	--	--	40	60	100	4
MC203	Operating Systems	4	--	--	40	60	100	4
MC204	Organizational Structure and Personnel Management	4	--	--	40	60	100	4
MC205	Software Engineering	4	--	--	40	60	100	4
MC251	Data Structures Lab	--	--	4	40	60	100	2
MC252	Database Management Systems Lab	--	--	4	40	60	100	2
MC253	Seminar	--	--	--	50	--	50	1
MC254	Mini Project	--	--	--	25	25	50	2
	TOTAL	20	--	8	355	445	800	27

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COURSE STRUCTURE

III – SEMESTER

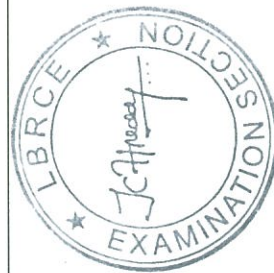| Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination				Credits
		Periods per Week			Maximum Marks			Total	
		Lectures	Tutorial	Lab.	Internal	External			
MC301	OOPs through JAVA	4	--	--	40	60	100	4
MC302	Computer Networks	4	--	--	40	60	100	4
MC303	Software Testing Methodologies	4	--	--	40	60	100	4
MC304	UNIX Network Programming	4	--	--	40	60	100	4
MC305	Operations Research	4	--	--	40	60	100	4
MC306	English Language Communication Skills - II	2	--	2	40	60	100	3
MC351	OOPs through JAVA Lab	--	--	4	40	60	100	2
MC352	UNIX Network Programming Lab	--	--	4	40	60	100	2
MC353	Seminar	--	--	--	50	--	50	1
	TOTAL	22	--	10	370	480	850	28

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COURSE STRUCTURE

IV – SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination				Credits
		Periods per Week			Maximum Marks			Total	
		Lectures	Tutorial	Lab.	Internal	External			
MC401	Design and Analysis of Algorithms	4	--	--	40	60		100	4
MC402	Advanced Java	4	--	--	40	60		100	4
MC403	Cryptography and Network Security	4	--	--	40	60		100	4
MC404	'Object Oriented Analysis & Design' Using UML	4	--	--	40	60		100	4
MC4051 MC4052 MC4053 MC4054	**ELECTIVE-I** Advanced Databases Distributed Operating Systems Software Design Methodologies Computer Graphics and Vision	4	--	--	40	60		100	3
MC451	Advanced Java Lab	--	--	4	40	60		100	2
MC452	'Object Oriented Analysis & Design' Using UML Lab	--	--	4	40	60		100	2
MC453	Seminar	--	--	--	50	--		50	1
MC454	Mini Project				50	50		100	2
MC455	Comprehensive Viva				--	100		100	2
	TOTAL	20	--	8	380	570		950	28

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COURSE STRUCTURE

V – SEMESTER

| Code No. | Name of the Course | Scheme of Instruction Periods per Week | | | Scheme of Examination Maximum Marks | | | Credits |
		Lectures	Tutorial	Lab.	Internal	External	Total	
MC501	Business Intelligence(BI)	4	--	--	40	60	100	4
MC502	Artificial Intelligence	4	--	--	40	60	100	4
MC503	Multimedia Application Development	4	--	--	40	60	100	4
MC5041 MC5042 MC5043 MC5044	ELECTIVE - II Database Tuning Open Source Software Software Quality Management Cloud Computing	4	--	--	40	60	100	3
MC5051 MC5052 MC5053 MC5054	ELECTIVE - III Database Administration UNIX Administration Software Project Management Principles of Programming Languages	4	--	--	40	60	100	3
MC551	Business Intelligence Lab	--	--	4	40	60	100	2
MC552	Multimedia Application Development Lab	--	--	4	40	60	100	2
MC553	Seminar	--	--	--	50	--	50	1
MC554	Comprehensive Viva					100	100	2
MC555	Industry Oriented Internship	--	--	--	--	100	100	2
	TOTAL	20	--	08	330	620	950	27

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COURSE STRUCTURE

VI – SEMESTER

Code No.	Name of the Course	Scheme of Instruction			Scheme of Examination				Credits
		Periods per Week			Maximum Marks				
		Lectures	Tutorial	Lab.	Internal	External	Total		
MC651	Project Work		------	------	50	150	200		20
	TOTAL				50	150	200		20

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I SEMESTER

MC101 –FUNDAMENTALS OF COMPUTERS AND C-PROGRAMMING

Lecture	: 4 Periods/week		Internal Marks	: 40
Tutorial	: 1 Period/Week		External Marks	: 60
Credits	: 4		External Examination	: 3 Hrs

UNIT- I

Introduction to Computers, History and Generations of Computers, Primary and Secondary memory, Input-output devices, ALU, Processor, Applications of computers, Introduction to DOS and Windows, Data representation. Types of languages, ASCII character set. Introduction to LAN, MAN, WAN, Internet and WWW.

UNIT - II

Algorithm / pseudo code, Flowcharts, Program development steps, Structure of C program, Identifiers, Basic data types and sizes, Constants, variables, arithmetic, relational and logical operators, increment and decrement operators, conditional operator, bit-wise operators, assignment operators, expressions, type conversions, conditional expressions, precedence and order of evaluation.
Control structures - If, If-Else, goto, labels, and switch statements, Loops- while, do-while and for statements, break, continue, Programming examples.

UNIT- III

Introduction to Arrays, 1-D arrays - declaration, definition, accessing elements, storing elements, Character arrays & Strings, string handling functions, Multidimensional arrays – example programs on arrays to expose various applications on different kinds of arrays.

UNIT - IV

Functions- basics, types of functions, types of parameters, parameter passing, storage classes- extern, auto, register, static, scope rules, Call by value, recursive functions, header files, C pre-processor, example programs. Pointers- concepts, declaration and initialization of pointer variables, pointers as function arguments, passing arrays to functions, dangling pointers, address arithmetic, pointers to pointers, pointers and multidimensional arrays, dynamic memory managements functions, command line arguments, C program examples.

UNIT - V

Derived Types-enum, typedef, structures- declaration, definition and initialization of structures, accessing structures, Nested structures, arrays of structures, structures and functions, pointers to structures, self referential structures, unions, bit-fields, Concept of a file, text files and binary files, Formatted I/o, file I/o operations, C program examples.

TEXT BOOKS

1. Introduction to computers by Peter Nortons, MGH 5th Edition.
2. Computer science, A structured programming approach using C, B.A. Forouzan and R.F. Gilberg, Third edition, Thomson.

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REFERENCES:

1. The C Programming Language, B.W. Kernighan, Dennis M.Ritchie, PHI/ Pearson.
2. C Programming with problem solving, J.A. Jones & K. Harrow, Dreamtech Press.
3. Programming in C, Stephen G. Kochan, III Edition, Pearson.
4. Let us C by YaswanthKanetkar.

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MC102 –DIGITAL LOGIC AND COMPUTER SYSTEM ORGANIZATION

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to Digital Computer.
1.1 Number system - Binary, Octal, HEXA and their inter-conversion, 1's and
    2's complement.
1.2 Boolean Algebra and Logic Gates, De-Morgan's Theorem, Duality Theorem,
1.3 K-Maps
1.4 Introduction, Binary Addition, Binary Subtraction, Addition/Subtraction of Numbers in 1's
Complement Notation, addition/Subtraction of Numbers in Two's Complement Notation,
Fixed and floating point representation of numbers.

UNIT - II

Combinational Circuits
2.1 Half Adder, Full Adder, Binary Adder and Subtracter
2.2 Decoder / Encoder.
2.3 Multiplexer / De-multiplexer
2.4 Sequential Circuits: Flip Flops - SR, D, JK, Master – Slave, Edge Triggered
2.5 Shift Registers.
2.6 Introduction to Counters: Synchronous as well as Asynchronous Counter

UNIT - III

Memory System
3.1 Memory Hierarchy
3.2 Primary Memory – DRAM, SDRAM, DDR, RDRAM. ROM, PROM, EPROM,
    EEPROM
3.3 Concepts of Auxiliary, Associative,
3.4 Cache And
3.5 Virtual Memory

UNIT- IV

CPU Organization
4.1 CPU Building Blocks
4.2 CPU Registers and BUS Characteristics. Interface Basics
    (Only Block Diagram) + Local Bus features & Types should be covered.
4.3 Addressing Modes, Instruction and Execution Interrupt cycle
4.4 Pipelining, Arithmetic Pipelining +RISC Pipelining
4.5 Micro programmed control - control memory, address sequence, micro program
example.

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UNIT - V

Input Output Organization
5.1 IO interface
5.2 Modes of Transfer
5.3 Asynchronous Data Transfer
5.5 Interrupt
5.6 Direct Memory Access
5.7 Input Output Processor, Types (SISD, SIMD, MIMD, MISD)

TEXT BOOK

MORRIS MANO, "Computer System Architecture "PHI Publication ,3rd edition.

REFERENCES

1.   THOMAS C BARTEE, "Digital Computer Fundamentals "TMH Publication ,6th edition.
2.   The Essentials of Computer Organization and Architecture Linda Null and Julia Lobur,2nd edition.
3.   Computer Organization and Architecture, William Stallings 8th edition, Pearson
4.   Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI, 2006
5.   Computer Organization & Design Pal Chaudhuri, 3rd edition, PHI.

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MC103 –ACCOUNTING AND FINANCIAL MANAGEMENT

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT- I

Fundamentals of accounting: Meaning, Nature and Scope of Accounting. Double entry system of accounting.User of accounting information, Role of Accountant in modern organization.
Accounting Process : Basic books of accounts – Journals, Ledger & subsidiary books. Preparation of trial balance, Final Accounts , company final accounts.

UNIT- II

Basics of Financial Management: Meaning and scope of Financial Management, Role of Financial Manager in Modern organization
Objectives of financial Management ,Time value of money , overview capitalization and under Capitalization, Financial accounting Vs Financial management Vs Cost accounting.

UNIT- III

Overview of Cost Accounting and Marginal Costing: Meaning, nature, Scope and importance of Cost Accounting, basic cost concepts, cost sheet. Absorption costing Vs Marginal Costing.Practical applications of marginal costing. Cost – volume – profit analysis –break Even point – significance and limitation of C-V-P Analysis, simple problems on marginal costing and C-V-P analysis.

UNIT- IV

Budgetary control and standard costing: Meaning and features of budgetary control – preparation of various types of budgets fixed and flexible budgets (production , sales, cash and master budgets) zero based budgeting.
Standard costing : Meaning and features of Standard costing – standard costing Vs budgetary control. Variance analysis – material, labor, over head and sales variances – simple problems.

UNIT- V

Accounting principles and computerized accounting: Generally accepted accounting principles (GAAP) accounting concepts and conventions –Accounting standards issued by ICAI. Computerization of Accounts – Accounting packages – Tally & wings – Documents used for data collection, files management, master files transaction files – processing of different files and output obtained.

TEXTBOOK

Basic Financial Accounting for Management by T. Paresh Shah, Oxford University Press, New Delhi 2008 edition.

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REFERENCES

1. Accounting for Management, T. Vijay Kumar, TMH.
2. Guide to Financial Management, John Tannent, Viva.
3. Financial Accounting, A. Mukherjee and M. Haneef, TMH
4. Basic Financial Accounting for Management, Ambaresh Gupta, Pearson
5. Cost & Management Accounting, S.N.Maheswari,sultanchand publications

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MC104 –DISCRETE STRUCTURES AND GRAPH THEORY

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Mathematical Logic: Statements and Notations, Connectives, Well formed Formulas, Truth Tables, Equivalence Implications, Normal Forms.
Rules of Inference, Consistency of premises and indirect method of proof. Predicate Calculus: Predicates, statement functions, Variables and Quantifiers, Predicate formulas, Free and Bound variables, Universe of discourse, Inference theory of predicate calculus.

UNIT- II

Set theory and Relations: Introduction, Relations and ordering, properties of binary relations, Equivalence, Compatibility relations, Partial Ordering, Hasse Diagram.
Functions: Composition of functions, Inverse function, Recursive functions, Pigeonhole principle and its applications.

UNIT - III

Elementary Combinatorics:
Basics of Counting, Combinations and Permutations, Binomial Coefficients, Binomial and Multinomial theorems, Principle of inclusion and exclusion.
Generating Functions: Generating function of sequences, calculating coefficient of generating functions
Recurrence Relations: Solving recurrence relations by substitution, by characteristic roots, by generating functions. Solution of non homogeneous recurrence relations

UNIT- IV

Graph Theory-I:
Basic concepts, Representation of Graph, BFS, DFS, Isomorphism and sub graphs, Multi graphs, Planar graphs, Euler circuits, Hamiltonian graphs, Chromatic Numbers.

UNIT- V

Graph Theory-II: Single source and All pairs shortest path problems- Dijkstra's and Floyd's algorithms, Transitive closure- Warshall's Algorithm, Spanning Trees, Kruskal's algorithm, Prim's algorithm.

TEXT BOOK

Discrete Mathematics for Computer Scientists and Mathematicians J.L.Molt, A.Kandel, T.P.Baker; PHI.

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REFERENCES

1. Discrete Mathematical Structures with Applications to Computer Science – J.P.Tremblery, R.Manohar; TMH.
2. Elements of Discrete Mathematics, C L Liu, D P Mohopatra, TMH.
3. Discrete Mathematics, Schaum's Outlines, Lipschutz, Lipson TMH.
4. Discrete Mathematical Structures, Kolman, Busby, Ross, 6thed; PHI, 2009.

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MC105 –PROBABILITY AND STATISTICAL APPLICATIONS

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT- I

Probability Theory: Sample spaces Events & Probability; Discrete Probability; Union, intersection and compliments of events; Conditional probability; Baye's theorem.

UNIT- II

Random variables and distribution: Random variables Discrete Probability Distributions, Continuous probability distribution, Mathematical Expectation or Expectation Binomial, Poisson, Normal. Sampling distribution: Populations and samples - Sampling distributions of mean (known and unknown) proportions, sums and differences. Central limit Elements.Theorem and related applications.

UNIT- III

Estimation – point estimation, interval estimation, Bayesian estimation, Text of hypothesis, one-tail, two-tail test, test of Hypothesis concerning means. Test of Hypothesis concerning proportions, F-test, goodness of fit.

UNIT- IV

Linear correlation coefficient Linear regression; Non Linear regression Least square fit ; polynomial and Curve fittings

UNIT- V

Queuing theory – Markov Chains – Introduction to Queuing systems – Elements of a queuing model – Exponential distribution – Pure birth and death models.Generalized Poisson Queuing model – Specialized Poisson Queues.

TEXT BOOK

Probability & Statistics.by T.K.V. Iyengar, S. Chand, 3rd Edition,2011.

REFERENCES

1.   Higher Engineering Mathematics by B.V.Ramana, 2009 Edition, TMH,New Delhi.
2.   Fundamentals of Mathematical statistics by S.C.Gupta&V.K.Kapoor Sultan Chand &Sons,New Delhi(2009).
3.   Probability and Statistics by Schaum outline series,LipschutzSeymour,TMH,NewDelhi, 3rd edition,2009.
4.   Probability and Statistics by Miller and Freund,Prentice Hall India,NewDelhi, 7th edition,2009.

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MC106 –ENGLISH LANGUAGE COMMUNICATION SKILLS

Lecture	: 2 Periods/week	**Internal Marks**	: 40
Lab	: 2 Periods/week	**External Marks**	: 60
Credits	: 3	**External Examination**	: 3 Hrs

This composite syllabus including Communication Skills Lab activities is designed for the students of MCA for various functional and situational purposes - professional or social. It aims at building effective language and communication competence, highly desirable social and behavioral traits required in academic and professional pursuits. This is sought to be achieved through an amalgamation of theoretical aspects and laboratory based skill oriented activities. Ultimately, employability quotient is sought to be improved in alignment with various soft skills.

UNIT – I

Communicative Grammar
Part A
Tense forms, Subject - Verb Agreement, Question Tags. Sounds of English (To Practice in the Lab)
Part B
One-Word Substitutes; Formation of Words, Using Words as Different Parts of Speech

UNIT - II

Communication – Process, Methods and Channels of Communication, Non Verbal Communication – Body Language

UNIT - III

Oral Presentations – Extempore & Prepared - Types of Presentation –JAM- Role Play- Group Discussion

UNIT - IV

Features of Effective Writing-7 Cs- Business Letters – Format - Style - Analysis of Sample Letters Collected from Industry – e-mail- Resume Writing

UNIT - V

Soft Skills-Significance and Components, Interpersonal Skills, Professional Etiquettes, Team Work, Empathy.This is a composite syllabus with equal emphasis on theory and conceptual clarity and practical exposure. Relevant cases have to be discussed in each unit and students must work in groups for Oral activities.

REFERENCES & SOFTWARE

1.   John Seely. *Oxford Guide to Effective Writing and Speaking*: Oxford University Press, New Delhi, 2005.
2.   Murphy. *English Grammar*: Cambridge University Press, New Delhi, 2009.
3.   RizviAshraf M .*Effective Technical Communication* : Tata McGraw Hill, New Delhi, 2008.
4.   Ramesh &Ramesh .*Ace of Soft skills*: Pearson Education, New Delhi, 2009.

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MC151 – FUNDAMENTALS OF COMPUTERS AND C – PROGRAMMING LAB

		Internal Marks	: 40
Lab/Practical	: 4 Period/Week	External Marks	: 60
Credits	: 2	External Examination	: 4 Hrs

LIST OF EXPERIMENTS

I) Student is expected to observe various components of computer physically and assembling and dissembling of components.

II) write a program in 'C' language to cover the following problems.

a) Roots of Quadratic Equation.

b) Example program which shows the usage of various Operators available in C Language.

c) Example program which shows the usage of various Data types available in C Language.

d) Example programs to illustrate the *order of evaluation*.

III) Write example programs

a) To check whether the given year is leep year (or) not

b) Converting given two digit number into words using switch statement

c) To illustrate the usage of goto statement.

d) Finding smallest& biggest number from the given set of 4 numbers using 'if' statement.

e) Calculate the student grade in the examination – assume suitable constraints.

f) Prepare electricity bill for the consumed units – assume suitable constraints.

IV) Example programs

a) Display first N natural numbers

b) To find whether the given number is Armstrong (or) not

c) To find reverse of the given number and to check whether it is palindrome (or) not.

d) To find whether given number is strong number (or) not.

e) To check whether given number is Prime (or) not

f) To display prime numbers with in the given range.

g) To display the following structure

```
i)              1                    ii) 5    4    3    2    1
                1        2                4    3    2    1
          1        2     3                3    2    1
     1        2    2     3            4    2    1
1         2        3     4        5   1
```

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V) a) Write a C program to find sum and average of given numbers using Arrays.

  b) To display elements of array in reverse order

  c) To search whether the given element is in the array (or) not using linear search & binary search.

  d) Write a C program to perform the following operations

i) Addition, subtraction and multiplication of Matrices

  ii) Transpose of given matrix

  e) Write a C program to find whether the given string is palindrome (or) not.

  f) To accept line of text and find the number of characters, number of vowels and number of blank spaces in it.

  g) Write an example program to illustrate the use of any 5 string handling functions.

VI) a) To find factorial of a given number using functions.

  b) Swap two numbers using functions.

  c) To find GCD of two numbers using recursion

  d) Write a recursive function to solve Towers of Honai problem.

  e) Write an example program to illustrate use of external & static storage classes.

VII) a) Example program to bring clarity on pointer declaration & initialization.

  b) Write an example program to describe the usage of *call by reference*.

  c) Write a program to find sum of the elements of the array using functions.

  d) Write an example program using command line arguments.

  e) Program to illustrate the usage of dynamic memory management functions.

VIII) a) Write an example program using structures to process the student record. Assume suitable fields for student structures (Different kinds of initialization of structure variables are to be exercised)

  b) Write a program to read records of 10 employees and find their average salary(exercise array of structures & Nested structures concepts through this program)

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MC152 – DIGITAL LOGIC AND COMPUTER SYSTEMS ORGANIZATION LAB

	Internal Marks	: 40
Lab/Practical : 4 Period/Week	External Marks	: 60
Credits : 2	External Examination	: 4 Hrs

EXERCISE 1
Using Logic Gates:- AND, OR, NOT , NOR, XOR, NAND, XNOR, Buffer

EXERCISE 2
Boolean Algebra: Theorems and logical Gates, verification of truth tables for some given expressions

EXERCISE 3
Realization of Boolean expressions ; Using (i) AND – OR-NOT Gates (ii) NAND Gates (iii) NOR Gates

EXERCISE 4
Latches Flip – Flops : RS, JK,T,D, Master –Slave FF, Edge – Triggered Flip – Flops

EXERCISE 5
Registers: All types of Shift Register s and Adder, Subtractor, Divider, Negator, Comparator

EXERCISE 6
Counters: Binary Counter, Synchronous Binary Counter, Synchronous Up/Down counter

EXERCISE 7
Asynchronous Binary Counter, Ripple Counter, Decade Counter, Up/Down Counter

EXERCISE 8
Modulo Counter: Modulo - 5, Modulo – 10

EXERCISE 9
Adders / Sub tractors: Half Adder, Full Adder, 1 's and 2's complement addition

EXERCISE 10
Multiplexers/ Data Selector: 2- input and 8- input, Demultiplexers , Logic Function Generator

EXERCISE 11
Decoders and Encoders

EXERCISE 12
BCD adders and Comparators

EXERCISE 13
Code Converters : Decimal –to-Binary, Binary – to – Decimal, Decimal – to- Hexa Decimal, BCD- to –Decimal, Binary – to- gray, gray- to –Binary

EXERCISE 14
RAM, ROM, PROM, EPROM – Testing Memory Chips

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REFERENCES

1. Digital Fundamentals, Floyd & Jain, Pearson, 2005
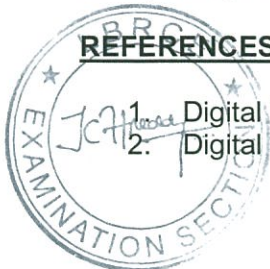2. Digital Logic and Computer Organization, Rajaraman, Radhakrishnan, PHI, 2006

II SEMESTER

MC201 –DATA STRUCTURES

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to the Datastructures, Linear and nonlinear, Static and dynamic data structures, Introduction to complexity analysis & asymptotic notations.
Searching & sorting techniques: Linear and Binary search methods, Bubble sort, Selection sort, Insertion sort, Quick sort, Merge sort.

UNIT - II

Dynamic Memory allocation, Linked List- Single and Double Linked List – Implementation of various operations

UNIT - III

Stack and Queues: Definition, representation, Applications, Infix to postfix conversion using stacks, Evaluation of Postfix expressions using stacks, Operations on Stacks and Queues, Circular Queues, DEQueues and Priority Queues.

UNIT - IV

Trees- Terminology, Binary trees representation and Tree traversals, Expression trees, BST and operations on BST, Heap and Heap sort, Threaded binary trees.

UNIT - V

Graphs – Terminology, Graph representation, Graph traversals-DFS, BFS, Dijkstra's, Warshall's and Floyd's algorithms, Minimum Cost spanning trees-Prim's and Kruskal's algorithms

TEXT BOOK

Fundamentals of Data structures by Horowitz &Sahani,Galgotia, 1st Edition.

REFRENCES

1. Introduction to Data structures with applications, Jean Paul Trembly& Paul G.Sorenson Second Edition, TMH.
2. Data structures using C and C++, Langsam, Augenstein and Tenenbaum, PHI.
3. Problem solving with C++, the OOP 4th Edition W.Savitch, Pearson Education.
4. Schaum's outline series – Theory and Problems of Data Structures by SeymourandLipschutz, MGH International Edition.
5. Schaum's outlines Data structures with C++ John R. Hubbard

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MC202 –DATABASE MANAGEMENT SYSTEMS

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Database system Applications, Database system Vs File system, View of data, Data abstraction, Instances and Schemas, Database users, Database system structure, Database design and ER diagrams, Beyond - ER Design Entities, Attributes, Entity sets, Relationships and Relationship sets, Additional features of ER model.

UNIT - II

Introduction to Relational model- Integrity constraints over the relations, Enforcing integrity constraints, Database Languages, DDL, DML, TCL, basic form of SQL query, Querying relational data, Logical database design, views, Destroying and altering tables/views. Nested queries correlated nested queries, Null values, Relation Algebra- selection, projection, renaming, join, examples.

UNIT - III

Schema refinement – Problems Caused by redundancy – Decompositions – Problem related to decomposition – reasoning about FDS – FIRST, SECOND, THIRD Normal forms – BCNF – Lossless-join Decomposition , Dependency- preserving Decomposition – Schema refinement in Data base Design – Multi valued Dependencies – Fourth Normal Form and Fifth Normal form.

UNIT - IV

Overview of Transaction Management: ACID properties, Transactions and Schedules, Concurrent Execution of transactions, Lock Based Concurrency Control, Performance Locking, Transaction Support in SQL, Serializability and Recoverability, Introduction to Lock Management, Lock Conversions, Dealing with Dead Locks, Concurrency without Locking. Crash recovery – Aries Recovery Algorithm.

UNIT - V

File organizations, Comparison of File Organizations
Index data Structures – Tree based Indexing, Hash based Indexing ,
Indexes and Performance Tuning,
Tree based Indexing: Indexed Sequential Access Methods (ISAM), B+ Trees: Dynamic Index Structure.
Hash Based Indexing: Static Hashing – Extendable hashing – Linear Hashing.

TEXT BOOK

Data Base Management Systems, Raghurama Krishnan, Johannes Gehrke, TMH

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REFERENCES

1.   Data Base System Concepts, 6/e, Silberschatz, Korth, TMH.
2.   Data Base Management System, 5/e, ElmasriNavathe, Pearson
3.   Introduction to Data Base Systems, 8/e, C.J.Date, Pearson
4..   Data Base Management Systems, Majumdr, Bhattacharyya, TMH ,96
5.   Data Base System Concepts, Peter ROB,Coronel,Cengage.

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MC203 –OPERATING SYSTEMS

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT - I

Introduction to Operating System: Definition of Operating System, Functions of Operating System, Multi-user, Multiprocessing, Multiprogramming, Time Sharing, Real Time Systems, Virtual Computer, Hardware Interface, CPU, Memory and addressing, Interrupts and I/O Devices, Operating System Structure, System Components, Services, System Calls, System Programs, System Design and Implementation.

UNIT - II

Process Management: Process concept, Context Switching, Process Control Block, Process Scheduling, Operations on Processes, Co-operating Processes, Inter Process Communication,
CPU Scheduling: Scheduling Concepts, Criteria, Scheduling Algorithms, Multiprocessor Scheduling, Real time Scheduling.

UNIT - III

Process Synchronization: Critical Section, Synchronization Hardware, Semaphores, Problems of Synchronization, Critical Regions, Monitors.
Deadlocks: Characterization, Handling Deadlocks, Deadlock Prevention, Avoidance, Detection, Deadlock Recovery.

UNIT - IV

Memory Management: Storage Hierarchy, Storage Management Strategies: Contiguous, Non Contiguous Storage Allocation, Single User-Fixed Partition, Variable Partition, Paging, Segmentation, Swapping-Virtual Memory concept, Demand paging and its performance, Need for Page Replacement, Page Replacement Algorithms, Thrashing.

UNIT - V

File System Interface and Implementation: Access Methods, Directory Structure, Protection, File system structure, Allocation Methods, Free space Management, Directory Management, Directory Implementation, Efficiency and Performance, RAID Levels.
Device management: Physical characteristics Disk Scheduling: FCFS, SST, and C- SCAN, sector queuing. I/O scheduling policies ,terminal I/O handling , channels and control units, I/O buffering, Disk Cache.

TEXT BOOK

Silberschatz, Galvin ,Gagne, "Operating System Principles", 7th Edition, Wiley.

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REFERENCES

1. Tenenbaum A.S., Modern Operating Systems, 2nd edition, Pearson Education, 2001
2. William Stallings, "Operating Systems", Sixth edition, PHI.
3. Milan Milankovic, "Operating Systems, Concepts and Design", McGraw-Hill.
4. Harvey M Deital, "Operating Systems", Addison Wesley
5. Operating System By Stuart .E. Madnick& John. J. Donovon

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MC204 –ORGANIZATION STRUCTURE AND PERSONNEL MANAGEMENT

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Introduction to Management: Concepts, Nature and definitions of Management-Management and administration, principles of management functions of management - planning, organizing, directing and controlling-importance of management-introduction to motivation.

UNIT - II

Classical Theories of Organization & Behavior Theories of Organization:
Functional approach-division of labor, levels of authority, span of control, authority & responsibility, Efficiency of management.
Concept of organization structure-formal and informal organization, difficulties due to informal organization-group behavior-Committee-motivation and theories of motivation.

UNIT - III

Human Resource Management: Objectives, functions of HRM, duties and responsibilities of HR department in the organization-changing, concepts of personal management

UNIT - IV

HR Planning, Training and Development: Preparation of man power inventory and forecasting, job description, recruitment, job specification and selection, Interviewing techniques, transfers, promotion and its policies.
Objectives of training-identifying training needs-training methods-on the job training-off the job training-job evolution-training functions India- state of-Art-survey.

UNIT - V

Communication, Strategic Management: Importance of communication, communication process-methods of -two way communication, barriers of communication, Organizational barriers-essentials of effective Communication system.
Introduction-study of Strategic Management-environmental scanning-internal environment and external environment SWOT analysis-challenges in LPG.

TEXT BOOK

Personnel and Human Resource Management,Recenzo,Robins,PHI,India.

REFERENCES

1. Human Resource Management by Gay Dessler-PHI,India.
2. Organization and Management,Agarwal,TMH.
3. Personnel management and Human Resources, VenkatRatnam,TMH.
4. Human Resource Management- L.M.Prasad, S.Chand Publications.
5. Human Resource & Personnel Management-Aswathappa, TMH

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MC205 –SOFTWARE ENGINEERING

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Introduction to Software Engineering: The evolving role of software, Changing Nature of Software, Software myths.
A Generic view of process: Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI)
Process models: The waterfall model, Incremental process models, Evolutionary process models, The Unified process.
Software Requirements: Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

UNIT - II

Requirements engineering process: Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management.
Design Engineering: Design process and Design quality, Design concepts, the design model.
Creating an architectural design: software architecture, Data design, Architectural styles and patterns, Architectural Design.

UNIT - III

Object-Oriented Design: Objects and object classes, An Object-Oriented design process, Design evolution.
Performing User interface design: Golden rules, User interface analysis and design, Interface analysis, interface design steps, Design evaluation.

UNIT - IV

Testing Strategies: A strategic approach to software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging.
Product metrics: Software Quality, Metrics for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.
Metrics for Process and Products: Software Measurement, Metrics for software quality.

UNIT - V

Risk management: Reactive vs Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan.
Quality Management: Quality concepts, Software quality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance, Software reliability, The ISO 9000 quality standards.

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TEXT BOOK

Software Engineering, A practitioner's Approach- Roger S. Pressman, 6th edition.
McGraw-Hill International Edition.

REFERENCES

1. Software Engineering- Somerville, 7th edition, Pearson education.
2. Software Engineering- K.K. Agarwal&Yogesh Singh, New Age International Publishers.
3. Software Engineering, an Engineering approach- James F. Peters, WitoldPedrycz, John Wiley.
4. Software Engineering principles and practice- Waman S Jawadekar, MGH.

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MC251 – DATA STRUCTURES LAB

	Internal Marks	: 40
Lab/Practical : 4 Period/Week	**External Marks**	: 60
Credits : 2	**External Examination**	: 4 Hrs

LIST OF EXPERIMENTS

Implement the following programs using C language.

1. Implement Linear and Binary Search mechanisms.

2. Sort the given list of numbers using a) Selection Sort b) Bubble Sort c) Insertion Sort d) Merge sort e) Quick sort

3. Create a single linked list and implement the following operations:
   a) Insert a node at specific position
   b) Delete a node from a specific position
   c) Counting the nodes
   d) Reversing the linked list

4. Create a Double linked list and implement the following operations:
   a) Insert a node at specific position
   b) Delete a node from a specific position
   c) Counting the nodes
   d) Reversing the linked list

5. Implement PUSH and POP operations on Stacks using Arrays. Handle the OVERFLOW and UNDERFLOW problems also.

6. Implement PUSH and POP operations on Stacks using Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

7. Implement Insertion and Deletion operations on Queues using Arrays. Handle the OVERFLOW and UNDERFLOW problems also.

8. Implement Insertion and Deletion operations on Queues Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

9. Implement Insertion and Deletion operations on Queues using Arrays and Linked List. Handle the OVERFLOW and UNDERFLOW problems also.

10. Write program to create a BST and traverse it in Inorder, Preorder and Post order.

11. Write a program to count the number of leaf nodes in a Binary tree.

12. Write a program to find the Path Matrix of a graph using Warshall's algorithm.

13. Implement BFS and DFS traversal techniques on a given graph.

14. Write a program to find the All Pairs Shortest Path matrix using Floyd's

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MC252 – DATABASE MANAGEMENT SYSTEMS LAB

	Internal Marks	**: 40**
Lab/Practical : 4 Period/Week	**External Marks**	**: 60**
Credits : 2	**External Examination**	**: 4 Hrs**

DATABASE MANAGEMENT SYSTEMS LAB (Using Oracle, SQL & PLSQL)

1. Creating tables for various relations(in SQL)
2. Construct a bank database with ER diagrams and tables with all IC's
3. Create sailors, reserves and boats tables and implement all algebraic operations.
4. Create a database for university with all IC's
5. Aggregate functions
6. String functions
7. Nested queries
8. Views
9. Writing Triggers on bank database
10. Writing triggers on university database
11. Writing functions
12. Writing procedures

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III SEMESTER

MC301 –OOPS THROUGH JAVA

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Features of OOPS:
Introduction to Java, History of Java, Features of Java, The Java Virtual Machine, Garbage collection , Java is important for Internet, Programming concepts of basic Java, Identifiers and Keywords, Data types in Java, Java coding conventions, Expressions in Java, Control structures, Decision making statements ,Arrays.

UNIT - II

Objects and Classes, Object fundamentals, Pass by value, Pass by reference, Overloading, Overriding, Constructors, Finalization, Subclasses(Inheritance), this, super, final with inheritance, Dynamic method dispatch, Scope rules, Static data, Static methods, Static blocks. ,All modifiers of class, String Handling, Command line arguments, Abstract Classes, Interfaces, Inner classes, Packages, Package access, Importing packages and classes, User define packages, Class-path.

UNIT - III

Exception Handling, Types of Exceptions, try, catch, finally, throw keywords, Creating your own Exceptions.
Multithreading - Differences between multiple processes and multiple threads, Thread states, Creating threads, Interrupting threads, Thread priorities, Synchronizing threads, Inter thread communication, Thread groups, Daemon threads.

UNIT - IV

Abstract Window Toolkit, Components and Graphics, Containers, Frames and Panels, Layout Managers, Border Layout, Flow Layout, Grid Layout, Card Layout, Event delegation model, Event source and handlers, Event categories, Listeners, Adapters classes, Anonymous classes.
Applets
Types of Applets, Applet life cycle, Graphics, getDocumentBase() &getCodeBase ()

UNIT - V

Java.util
Java utility packages, Classes & Interfaces, HashTable, Vector, ArrayList, StringTokenizer, Date.
SWINGS
Introduction to Swings: Japplet, Handling Swing Controls like Icons, Buttons, TextBoxes, CombBoxes, TabbedPanes, ScrollPanes, JTree, JTable, Differences between AWT Controls & Swing Controls, developing home page using Applets & Swings.
JAVA I/O
Files and Streams, Stream classes, Reader-Writer classes, File class tests and Utilities, Serialization and Deserialization.

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TEXT BOOK

The Complete Reference Java J2SE ,7th Edition, Herbert Schildt, TMH Publishing Company Ltd, New Delhi.

REFERENCES

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

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MC302 –COMPUTER NETWORKS

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Introduction:
Uses of Computer Networks, Network Hardware: LAN, MAN, WAN, Bridges, Repeaters, Gateways, Network Software: Protocol hierarchies, Design issues, Types of services, Reference models: OSI, TCP/IP, ATM
Physical Layer:
Guided Transmission Media

UNIT - II

Data Link Layer:
Design issues of Data Link Layer, Error Correction and Detection, Elementary Data Link Protocols: Unrestricted Simplex Protocol, Stop and Wait, Simplex Protocol for noisy channel, Sliding Window Protocol, Go back N, Selective Repeat, HDLC.
Medium Access Control sublayer (MAC): Multiple Access Protocols, Ethernet-802.3, Wireless LAN, Bluetooth.

UNIT-III

Network Layer:
Design Issues of Network Layer, Routing Algorithms: Optimality, Shortest path, Flooding, Distance Vector Routing, Hierarchical Routing, and Routing for Mobile Hosts. Congestion Control Techniques: Leaky Bucket, Token Bucket. Congestion Prevention Techniques: Traffic Shaping, Choke Packet, Load Shedding, Jitter Control.

UNIT-IV

Transport Layer
Services of Transport Layer, Elements of Transport Protocols:UDP and TCP, Service Model, Protocol segment Header, Connection Establishment, Connection Release, TCP Connection Management.

UNIT-V

Application Layer
DNS: Domain Name System, Electronic Mail (SMTP) :Architecture, User Agent , Message Format, Message Transfer, Delivery, FTP, The World Wide Web (HTTP) , Introduction to Storage Area Networks(SAN), Peer-to-Peer Networks

TEXT BOOK

Andrew S. Tanenbaum "Computer Networks" Fourth Edition, Pearson Education-2002.

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REFERENCES

1. BehrouzA.Frouzon "Data Communications and Networks" Tata McGraw Hill Publication, 2006
2. William Stallings "Data and Computer Communication "Sixth Edition , Pearson Education Asia, 2002.
3. Larry L.Peterson and Bruce S.Davie "Computer Networks" A system approach Third Edition, Kaufmann Publisher, 2003.
4. Computer Communication and Networking Technologies" Michel A. Gallo, William M.Hancock- Thomson Publication.
5. Understanding Data Communications and Networks, William Ashay, 2nd Edition, Vikas Publishing House.

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MC303 –SOFTWARE TESTING METHODOLOGIES

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT-I

Basics of Software Testing:

Humans, Errors and Testing, Software Quality, Requirements, Behavior and Correctness, Correctness versus Reliability, Testing and Debugging, Test Metrics, Software and Hardware testing, Testing and Verification, Defect Management, Execution History, Test-Generation stratagies,Static Testing, Control flow Graph, Dominators and Post Dominators, Program dependence Graph.

UNIT -II

Testing Techniques:

Levels of Testing, Acceptance Testing. Special Tests: Complexity Testing, GUI Testing, Security Testing, Performance, Volume and Stress Testing, Recovery Testing, Requirement Testing, Regression Testing, Smoke Testing, Sanity Testing, Adhoc Testing, State Graph, Object-Oriented Applications Testing, COTS Testing.

UNIT -III

Test Planning:

Test policy, Test strategy, Test plan, Quality plan and Test plan, Quality plan template, Test plan template, Guidelines for developing the Test plan, Test Standards, Building Test data and Test cases, Test scenario, Test cases, Template for Test cases, Test scripts, Test Log Document, Effective Test cases, Test file, Building Test data, Generation of Test data, Roles and Responsibilities in Testing life cycle, Test progress monitoring.

UNIT-IV

Test Metrics and Test Reports:

Test Metrics and Test Reports, Categories of the Product/Project Test Metrics, Estimated, Budgeted, Approved and Actual, Resources Consumed in Testing, Effectiveness of Testing, Defect Density, and Defect Leakage Ratio, Residual Defect Density, Test team efficiency, Test case efficiency, Rework ,MTBF/MTTR, Implementing Measurement Reporting System in an Organization, Test Reports, Project Test Status Report,
Test Reports: Integration Test Report, System Test Report, Acceptance Test Report, Guidelines for writing and using Report, final Test Reporting, Test Status Report.

UNIT -V

Test process Improvement:

The need for Test process Improvement, Test process Maturity, Test process Improvement Model, Test process Improvement Model stages, Graphical representation of Improvements.
Testing Tools:
Introduction, Features of Test Tool, Guidelines for selecting a Tool, Tools and Skills of Tester, Static Testing Tools, Dynamic Testing Tools, Advantages of using Tools, When to use Automated Test Tools.

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TEXT BOOK

Software Testing, Principles, Techniques, and Tools.—M G Limaye (TMH).

REFERENCES

1. Foundations of Software Testing. – Aditya P. Mathur
2. Software Testing techniques - BarisBeizer, Dreamtech, second edition.
3. Software Testing Tools – Dr.K.V.K.K.Prasad, Dreamtech.
4. Software Testing Techniques – SPD(Oreille)
5. Software Testing in the Real World – Edward Kit, Pearson.
6. Effective methods of Software Testing, Perry, John Wiley.

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MC304 –UNIX NETWORK PROGRAMMING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT-I

Unix Utilities-Introduction to Unix file system, Features of Unix OS, vi editor, File handling utilities, Security by file permissions, Process utilities, Disk utilities, Networking commands, cp, mv, ln, rm,unlink, mkdir, rmdir, du, df, mount, umount, find, umask, ulimit, ps, who, w, finger, arp, ftp, telnet, rlogin, text processing utilities and backup utilities, detailed commands to be covered are cat, tail, head, sort, nl, uniq, grep, egrep, fgrep, cut, paste, join, tee, comm, cmp, diff, tr, tar, cpio.

UNIT-II

Problem solving approaches in Unix: Using single commands, Using compound commands, Shell scripts, C programs, Building own command library of programs. Working with the Bourne shell: what is a shell, Shell responsibilities, Pipes and input redirection, Output redirection, here documents, Shell as a programming language, Shell meta characters, Shell variables, Shell commands, Environment, Control structures, Shell script examples.

UNIT-III

Unix Files: Unix file structure, Directories, Files and devices, System calls, Library functions, Low level file access, Usage of open, creat, read, write, close, lseek, stat, fstat, umask, dup, dup2, Standard I/O (fopen, fclose, fflush, fseek, fgetc, getc, getchar, fputc, putc, putchar,fgets, gets), formatted I/O, Streams and file descriptors, File and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd), Directory handling system calls (opendir, readdir, closedir,rewinddir, seekdir, telldir)

UNIT-IV

Unix Process: What is Process, Process structure, Starting new process, Waiting for a process, Zombie process, Process control, Process identifiers, System call interface for process management-fork, vfork, exit, wait, waitpid, system,FIFOS.
Semaphores-Unixsystem-V Semaphores, Unix kernel support for Semaphores, Unix APIs for Semaphores.

UNIT-V

Message Queues-Unix system-V Messages Queues, Unix kernel support for Message Queues, Unix APIs for Message Queues, Client/Server example.
Shared Memory-Unix system-V Shared memory, Unix kernel support for shared memory, Unix APIs for shared memory, Semaphore and Shared memory example.
Sockets: Berkeley Sockets, Socket system calls for connection oriented protocol and connectionless protocol, Client/Server example.

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TEXT BOOK

Unix Network Programming, W.R.Stevens Pearson/PHI

REFERENCES

1. Unix Concepts and Applications, 3rd Edition, Sumitabha Das, TMH.
2. Unix system programming using C++, T.Chan, PHI.
3. Unix for programmers and users, 3rd Edition, Graham Glass, King Ables, Pearson Education.
4. Unix System-V Network Programming, Stephen A.Rago, Pearson Education.
5. Unixprogramming environment, Kernighan and Pike, PHI. / Pearson Education.

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MC305 –OPERATIONS RESEARCH

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT- I

Development: Characteristics and Phases scientific method, Types of models, General methods for solving OR problems, Operations Research models, Significance of operations research.

Linear Programming: Introduction to Linear Programming, Two phase Simplex method, Big-M method ,Duality, Interpretation, Applications.

UNIT- II

Transportation Problem: Introduction, Optimal solution, Un-balanced transportation problem, Degeneracy, Assignment problem: formulation optimal solution, variations. 1. a non-square (mxn) matrix, Restrictions.

Sequencing Model: Classification of self-problems, processing of n jobs through two machines, three machines, processing of two jobs through m machines.

UNIT- III

Network optimization Models: Shortest path problem, Minimum spanning tree problem, Maximum flow problem, Minimum cost flow problem, The project management with PERT/CPM, Scheduling a problem with PERT/CPM, Dealing with uncertain activity durations, Considering time cost trades Offs, Scheduling and Controlling, Projects costs, Evaluation of PERT/CPM.

UNIT- IV

Waiting Lines: Introduction, Single channel, Poisson arrivals, Exponential service times, Unrestricted queue, with infinite population models, Single channel, Exponential Service times with infinite population and restricted queue, Multi-channel, Exponential service times with infinite population and unrestricted queue.

UNIT - V

Dynamic Programming: Introduction, Billman's principal of optimality, Solution of problems with finite number of stages.

TEXT BOOK

S.D.SHARMA: Operations Research, KedarnathRamnath, Meerut.

REFERENCES

1. P.K.GUPTA & D.S.HIRA: Operations Research, S. Chand
2. Taha, Operations Research, Macmillan.

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MC306 –ENGLISH LANGUAGE COMMUNICATION SKILLS - II

Lecture	: 2 Periods/week	**Internal Marks**	: 40
Lab.	: 2 Periods/week	**External Marks**	: 60
Credits	: 3	**External Examination**	: 3 Hrs

This composite syllabus including Communication Skills Lab activities is designed for the students of MCA for various functional and situational purposes - professional or social. It aims at building effective language and communication competence, highly desirable social and behavioral traits required in academic and professional pursuits. This is sought to be achieved through an amalgamation of theoretical aspects and Laboratory –based skill oriented activities. Ultimately, Employability quotient is sought to be improved in alignment with various soft skills

UNIT - I

Communicative Grammar
Part A
Sounds of English- accent & stress, Spotting the errors, voice change, Direct & Indirect speech
Part B
Idioms and phrases; Words often confused

UNIT - II

Communication - Listening-process & requisites of good listening – Reading skills- process & requisites – Barriers to Effective Communication -Body Language

UNIT - III

Oral Presentations – Technical - Seminar preparation - Interview Skills – types - Mock Interviews

UNIT - IV

Technical Report writing - Types- Format- Analysis of sample reports from Industry - Academic writing-Synopsis and thesis writing, Statement of purpose

UNIT - V

Soft skills - Leadership development strategies - Team work- concept and exercises - Cross cultural communication - Networking skills

This is a composite syllabus which seeks to place equal emphasis on theory and developing conceptual clarity and practical exposure. Relevant cases have to be discussed in each unit and students must work in groups for oral activities.

REFERENCES & SOFTWARE
1. Technical communication by Raman and Sharma, OUP
2. Murphy, English Grammar, Cambridge
3. Effective Technical communication by RizviAshraf , TMH
4. Soft skills: know yourself & know the world, K. Alex, S.chand
5. Oxford Guide to Effective Writing and Speaking by John Seely, OUP
6. Clarity Software

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MC 351 –OOPS THROUGH JAVA LAB.

Lab.	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 2	**External Examination**	: 3 Hrs

1) Write a Java program to find the roots of a quadratic equation?
2) Write a Java program to generate first n Fibonacci numbers?
3) a) Write a Java program to reverse the given number?
   b) Write a Java program to check whether given number is Prime or not?
4) Write a Java program to check whether given number is Palindrome or not?
5) Write a Java program to check whether given number is Armstrong or not?
6) Write a Java program to find factorial of the given number using recursions?
7) Write a Java program to find min and max number of given array?
8) Write a Java program to search an element by using linear search and binary search?
9) Write a Java program to sort the elements of an Array?
10) Write a Java program to perform Matrix Multiplication?
11) Write a Java program using constructors
12) Write a Java program using inheritance?
13) Write a Java program to implement Method over Loading and Method over riding?
14) Write a Java program by using this and super key word.
15) Write a Java program by using final variables and final methods.
16) Write a Java program to implement dynamic method dispatch.
17) Write a Java program using abstract class?
18) Write a Java program to implement Multiple Inheritance (Interface)?
19) Write a Java program on demonstration of packages?
20) a) Write a Java program to check whether given string is palindrome (or) not. ?
    b) Write a Java program to sort the set of strings in sorting order?
    c) Write a Java program to find sum of the numbers using String Tokenizer?
21) Write a Java program by using length () and capacity () Methods of String Buffer?
22) Write a Java program to find the sum of the numbers by using command line arguments?
23) (a) Write a Java program by using Exception handling Mechanism including Finally block?
    (b) Write a Java program to Handle User Defined Exceptions?
24) (a) Write a Java program to create Multithreads?
    (b) Write a Java program on Thread Synchronization
25) Write a Java program to implement Inter thread communication?
26) (a) Write a sample Applet program to Display Message?
    (b) Write an Applet program using Graphics?
    (c). Write an Applet program to pass parameters to Applet.
27) (a). Write a Java program to create user login by using AWT components?
    (b). Write a Java program to implement arithmetic calculator using Swing Components?
28) (a) Write an applet program to handle Mouse Events?
    (b) Write an applet program to handle Key Events using adapter Class?

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MC 352 –UNIX NETWORK PROGRAMMING LAB.

Lab.	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 2	**External Examination**	: 3 Hrs

1. Write a Shell script to generate a multiplication table.

2. Write a Shell script that copies multiple files to a directory.

3. Write a Shell script that counts the number of lines and words present in a given file.

4. Write a Shell script that displays the list of all files in the given directory.

5. Write a Shell script (small calculator) that adds, subtracts, multiplies and divides the given two integers. There are two division options: one returns the quotient and the other returns reminder. The script requires 3 arguments: The operation to be used and two integer numbers. The options are add (-a), subtract (-s), multiply (-m),   quotient (-c) and reminder (-r).

6. Write a Shell script to reverse the rows and columns of a matrix.

7. Write a C program that counts the number of blanks in a text file.
   (a) Using standard I/O
   (b) Using system calls.

8. Implement in C the following Unix commands using system calls.
   a) cat   b) ls   c) mv

9. Write a program that takes one or more file/directory names as command line input and reports the following information on the file:
   a) File type   b) Number of links   c) Time of last access,
   d)Read, Write and Execute permissions.

10. Write a C program that illustrates uses of the mkdir, opendir, readdir, closedir, and rmdir APIs.

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11.   Write a C program that illustrates how to execute two commands concurrently with a command pipe.

12.   Write a C programs that illustrates the following:
        a) Two-way communication with unidirectional pipes.
        b) Two-way communication with bidirectional pipes

13.   Write a C program that illustrates the creation of child process using fork system call.

14.   Write a C program that displays the real time of a day every 60 seconds.

15.   Write a C program that illustrates file-locking using Semaphores.

16.   Write a C program that implements a Producer-Consumer system with two processes. (Using semaphores)

17.   Write a C program that illustrates InterProcessCommunication(IPC) using shared memory system calls.

18.   Write a C program that illustrates the following.
        a) Creating a Message Queue.
        b) Writing to a Message Queue.
        c) Reading from a Message Queue.

19.   Write a C program to develop simple Client /Server application using Sockets(system calls).

REFERENCES

1.   Unix and Shell programming, B.A.Forouzan and R.F.Gilberg, Thomson.
2.   Advanced Unix Programming, N.B.Venkateswarulu, BS Publications.

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IV SEMESTER

MC401 –DESIGN AND ANALYSIS OF ALGORITHMS

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

Introduction: Algorithm, Pseudo code for expressing algorithms, Performance Analysis: Space complexity, Time complexity, Asymptotic Notation: Big Oh notation, Omega notation, Theta notation,

Divide and conquer: General method, Applications, Binary search, Quick sort, Merge sort, Stassen's matrix multiplication.

UNIT - II

Greedy Method: General method, Applications: Job sequencing with deadlines, knapsack problem, Minimum cost spanning trees, Single source shortest path problem,Optimalstorage on tapes.

Basic Search and traversal Techniques: AND/OR graphs, Biconnected components, Depth-first search, Breadth - first Search.

UNIT - III

Dynamic Programming: General method, Applications: Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales man problem, Reliability Design.

UNIT - IV

Backtracking: General method, Applications: n-queens problem, sum of subsets problem, graph colouring, Hamiltonian cycles.

UNIT - V

Branch and Bound: General method, Applications - Travelling sales person problem,0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution.NP-Hard and NP-Complete problems: Basic concepts, Non deterministic algorithms, NP - Hard and NP Complete classes, Cook's theorem.

TEXT BOOK

Fundamentals of Computer Algorithms, Ellis Horowitz, SatrajSahni and Rajasekharam,Galgotia publications pvt.Ltd.

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REFERENCES

1. Algorithm Design: Foundations, Analysis and Internet examples, M.T.Goodrich and R.Tomassia,Johnwiley and sons.
2. Introduction to Algorithms, secondedition,T.H.Cormen,C.E.Leiserson, R.L.Rivest,andC.Stein,PHI Pvt. Ltd./ Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T.Lee, S.S.Tseng, R.C.Chang and T.Tsai, McGraw Hill.
4. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
5. Design and Analysis of algorithms, Aho, Ullman and Hopcroft,Pearson education.
6. Algorithms – Richard Johnson baugh and Marcus Schaefer, Pearson education.

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MC402 –ADVANCED JAVA

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT- I

HTML: Introduction, Common tags ,HTML Tables and formatting internal linking, Complex HTML forms. Introduction to Scripting Languages: Java Script, Control structures

UNIT - II

Java script functions, Arrays & Objects, DHTML, CSS, Event model
XML: Introduction, DTD, Schema.
Parsers: DOM and SAX.

UNIT-III

JDBC: Database Programming using JDBC, Studying Javax.sql.* package
Types of JDBC Drivers, Writing JDBC applications using select, insert, delete, update, Types of Statement objects (Statement, Prepared Statement and Callable Statement); ResultSet, ResultSetMetaData, Inserting and updating records,
BDK: Introduction to Java Beans, Advantages of Java Beans, BDK, Introspection, Using Bound properties, Bean Info Interface, Constrained properties, Persistence, Customizers, Java Beans API

UNIT-IV

Servlets: Introduction of Servlet, HTTP Servlet Basics, Types of Servlets and Life cycle, Servlet API Overview; Writing and running Simple Servlet.ServletConfig&ServletContext, Writing Servlet to handle Get and Post Methods, Reading user request data,Writing thread safe Servlets,Concept of cookies, Reading and writing cookies, Need of Session Management, Types of Session management,UsingHttpSession Object ,Servlet chaining , Servlet & JDBC,
How to configure TOMCAT, Directory structure for a web Application

UNIT-V

JSP:
The Problem with Servlets, The anatomy of a JSP Page, JSP Processing, JSP Application Design with MVC.
Introduction to JSP and JSP Basics, Implicit Objects,JSP Tags, Life cycle of JSP, JSP and Java Beans, JSP:sessions and cookies, Error Handling with JSP, JDBC with JSP

TEXT BOOK

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

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REFERENCES

1. J. McGovern. Adatia,Y. Fain, 2003, J2EE 1.4 Bible, Wiley-dreamtech India Pvt. Ltd, New Delhi.2. H. Schildt, 2002,
2. JAVA Complete Reference, 5th Edition, Tata McGraw-Hill, New   Delhi.
3. K. Moss, 1999, Java Servlets, Second edition, Tata McGraw Hill, New Delhi.
4. D. R.Callaway, 1999, Inside Servlets, Addison Wesley, Boston
5. Joseph O'Neil, 1998, Java Beans from the Ground Up, Tata McGraw Hill
6. TomValesky, Enterprise JavaBeans, Addison Wesley. 7. Cay S Horseman & Gary Cornell, Core Java Vol II Advanced Features, Addison Wesley.

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MC403 –CRYPTOGRAPHY AND NETWORK SECURITY

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT - I

INTRODUCTION:
Security Trends, OSI Security Architecture, Security Attacks, Security Services, Security Mechanism, A model for Network Security
Symmetric Cipher:
Classical Encryption Techniques, Block Ciphers, Data Encryption Standard, Advanced Encryption Standard, Triple DES, Placement of Encryption Function, Traffic confidentiality, Key Distribution, Random Number Generation.

UNIT - II

PUBLIC-KEY CRYPTOGRAPHY
Number Theory, Principles of public-key Cryptosystems, RSA, Key Management, Diffie-Hellman Key Exchange, Elliptic Curve Arithmetic and cryptography.

UNIT - III

AUTHENTICATION AND HASH FUNCTIONS
Authentication Requirements and Functions, Message Authentication Codes, Hash Functions, Security of Hash Function and MACs, Secure Hash Algorithm,HMAC,CMAC,Digital Signatures, Authentication Protocols, Digital Signature Standard.

UNIT - IV

NETWORK SECURITY
Authentication Applications: Kerberos,X.509 Authentication Service, Public-Key Infrastructure, Electronic Mail Security: PGP,S/MIME, IP Security, Web Security

### UNIT - V

SYSTEM SECURITY
Intruders, Intrusion Detection, Password Management, Viruses and Related Threads, Virus Counter Measure, Firewall Design principles, Trusted Systems.

TEXT BOOK

"Cryptography and Network Security Principles and practices" by William Stallings 4th Edition, Prentice Hall.

REFERENCES

1. "Fundamentals of Network Security" by Eric MaiwaldDreamtech press
2. "Principles of Information Security", by Whitman, Thomson
3. "Network Security: the complete reference", by Robert Bragg, Mark Rhodes,TMH
4. "Introduction to Cryptography" by Buchmann, Springer.

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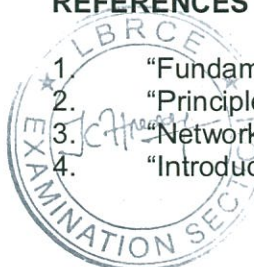
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MC404 –OBJECT ORIENTED ANALYSIS & DESIGN USING UML

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT-I

Introduction to UML: Object, Object Orientation, Development, Modeling, Object Modeling, Importance of Modeling, Principles of Modeling, Conceptual model, Model Driven Architecture with UML, Software Development Life Cycle of UML, UML Architecture

UNIT-II

Basic Structural Modeling: Classes, Relationships, Diagrams.
Advanced structural Modeling: Advanced Classes, Advanced relations, Interfaces, Types and Roles

UNIT-III

Class & Object diagrams: Terms, Concepts, Common Modeling techniques for Class & Object diagrams.
Basic Behavioral Modeling –I: Interactions, Interaction diagrams.
Basic Behavioral Modeling –II: UseCases, UseCase Diagrams, Activity Diagrams.

UNIT-IV

Advanced Behavioral Modeling: Events and Signals, State machines, State chart diagrams.
Architectural Modeling: Component, Development, Component Diagrams, and Deployment Diagrams.

UNIT-V

Design Patterns:- Introduction, Benefits of patterns, Creational patterns, Structured Patterns, Behavioral patterns, Expectations from Design Patterns, Pattern Community.

TEXT BOOK

Grady Booch, James Rambaugh, Ivar Jacobson: The Unified Modeling Language User Guide, Pearson Edition

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REFERENCES

1. Craig Larman," Applying UML and Patterns- An Introduction to Object oriented Analysis and Design and Iterative Development", 3rd Edition Pearson Edition.
2. HansEriksson, Magnus,Penker, BrainLyons, DavidFado:UML2Toolkit, WILEY-Dreamtech India Pvt.Ltd
3. MeilirPage-Jones:Fundamentals of Object Oriented Design in UML-Pearson Education
4. AtulKahate: Object Oriented and Design,The McGraw-Hill Company
5. Grady Booch, James Rambaugh, Ivar Jacobson: The Unified Modeling Language Reference Manual, Addison Wesley,1999
6. Object Oriented Analysis and Design Bennett,Simon McGraw Hill

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MC4051 –ADVANCED DATABASES

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 3	**External Examination**	: 3 Hrs

UNIT - I

Object Oriented Databases: Concepts for Object databases, Object database Standards, Languages and Design.
Parallel Databases- Introduction: I/O Parallelism, Inter- Query Parallelism, Intra-Query Parallelism, Intra-Operation Parallelism, Inter–Operation Parallelism, Design of Parallel System.

UNIT - II

Active Database concepts and Triggers, Temporal database concepts, Multimedia Databases, Deductive databases.

UNIT - III

Distributed databases:
Distributed Database Concepts, Data fragmentation, Replication and Allocation techniques for Distributed database Design, Types of Distributed Database Systems, Query processing in Distributed Databases, Concurrency control and Recovery in Distributed Databases, 3-tier Client-Server architecture, Distributed Databases in Oracle.

UNIT - IV

Query processing & Optimization:
Query processing: Measures of Query cost, Selection Operation, Sorting, Join Operation, Other Operations, Evaluation of Expressions.
Query Optimization: Overview, Transformation of relational Expressions, Estimating Statistics of Expressions, Results, Choice of Evaluation plans, and Materialized views.

UNIT - V

Advanced transaction processing :
Transaction processing monitors, Transactional work flow, Real time transaction system, Long duration transactions, Transaction management in multimedia databases

TEXT BOOK

Fundamentals of Database Systems – Elmasri, Navathe, Somayajulu, Gupta. 4th edition,Pearson.

REFERENCES

Database System Concepts- Abraham Silberschatz, Henry F.Korth, S.Sudarshan. 5th edition,McGrawHill.

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MC4052 –DISTRIBUTED OPERATING SYSTEMS

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT - I

Introduction
Definition of a DOS, Goals, H/w and S/w Concepts, Client-Server Model
Processes Threads: Introduction to Threads, Threads in Distributed Systems, Clients: User Interfaces, Client-Side Software for Distribution Transparency; Servers: General Design Issues, Object Servers; Code Migration: Approaches to Code Migration, Migration and Local Resources, Migration in Heterogeneous Systems; Software Agents: Software Agents in Distributed Systems, Agent Technology.

UNIT - II

Naming Systems:
Naming Entities: Names, Identifiers, and Addresses, Name Resolution, The Implementation of a Name Space, Example: DNS, X.500Locating Mobile Entities: Naming versus Locating Entities, Simple Solutions, Home-Based Approaches, Hierarchical Approaches Clock synchronization, logical clocks, global state, election algorithms, mutual exclusion.

UNIT - III

Consistency and Replication:
Introduction, Data-Centric Consistency Models, Client-Centric Consistency Models, Distribution Protocols, Consistency Protocols.
Fault Tolerance:
Introduction to Fault Tolerance, Process Resilience, Reliable Client-Server Communication, Reliable Group Communication, Distributed Commit.

UNIT - IV

Distributed File System
Sun Network File System, Coda File System, Plan~9, XFS and SFS, Scalable Security. Distributed Shared memory: Introduction, Bus based multi processors, Ring based multiprocessors, Switched multiprocessors - NUMA comparison of shared memory systems.

UNIT - V

Distributed Object Based System
CORBA, Distributed Com, Globe and Comparison of CORBA, DCOM.
Distributed Document-Based System and Coordinate Based System
The World Wide Web, Lotus Notes, Comparison of WWW and Lotus Notes.

TEXT BOOK

Distributed Systems, Principles and paradigms, 2/e Tanenbaum,MaartenVansteen, Pearson education.

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REFERENCES

1.   Andrew S.Tanenbaum: Distributed Operating System, Prentice Hall International Inc. 1995,McGrawHill.
2.   Distributed Operating Systems & Algorithm Analysis, Chow, Johnson,PEA.
3.   Distributed Systems Concepts and Design 4/e , George coulouris, Dollimore ,Kindberg ,PEA
4.   Distributed Operating Systems ,PradeepK.Sinha ,PHI,2009.

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MC4053 –SOFTWARE DESIGN METHODOLOGIES

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT - I

Basic concepts of Design:
Introduction, Characteristics of Design activities, Essential elements of Designs.
Design Quality:
Software Quality models: Hierarchical models, Relational models,
The effect of Design on software quality, Efficiency, Correctness and Reliability, Portability, Maintainability, Reusability, Interoperability, Quality attributes of software Design, Witt, Baker and Merritt's Design objectives, Parnas and Weiss's requirements of good Designs, Quality of development process
Design Principles:
Basic rules of software Design: Causes of difficulties, Vehicles to overcome difficulties, Basic rules of software Design
Design processes: The context of Design in Software development process, Generic Design process, Descriptive models, Structure of software Design methods

UNIT - II

Software Architecture:
The notion of Architecture: Architecture in the discipline of buildings, Architecture in the discipline of computer hardware, General notion of architecture. The notion of software architecture, Prescriptive models, Descriptive models, Multiple view models, Roles of architecture in software Design. Software architectural style, Introductory examples, the notion of software architectural style.
Description of Software Architectures:
The Visual Notation: Active and Passive elements, Data and control Relationships, Decomposition/Composition of Architectural elements

UNIT - III

Typical Architectural Styles:
Data flow: General data flow styles, The pipe- and filter sub-style, The batch sequential processing ,sub-style Independent components: the general independent components style, the event-based implicit invocation systems sub-style.
Call and return:
The general call and return style, the layered systems sub-style, Data Abstraction: the abstract data type and object-oriented sub-style
 Data-centered style, Virtual machine Architecture
Using Styles in Design:
Choices of styles, Combinations of styles: Hierarchical heterogeneous styles, Simultaneously heterogeneous styles, Locationally heterogeneous styles

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UNIT - IV

Architectural Design space:
Theory of Design spaces: Structure of Design spaces, Solving Design synthesis and analysis problems ;Design space of architectural elements: Behavior features, Static features, Design space of architectural styles,Characteristic features of architectural styles, Classification of styles

Scenario-Based Analysis and Evaluation:
The concept of scenario,Scenarios for evaluating modifiability, Scenarios for evaluating Performance, Scenarios for evaluating reusability.

UNIT - V

Analysis and Evaluation of Modifiability: SAAM Method:
The input and output, the process (Activities in SAAM Analysis)
Quality Trade- Off Analysis: ATAM Method
ATAM analysis process, ATAM analysis activities
Model-Based Analysis: HASARD Method
 Representation of quality models, construction of quality models.

TEXT BOOK

Software Design Methodology: From Principles to Architectural Styles , Hong zhu, Elsevier,2009

REFERENCES

1.   Software Architecture: Perspectives on an Emerging discipline, Shaw, M.,Garlan, PEA, 2008.
2.   Software Architecture in Practice, Bass, L., Clements P,Kazman, PEA,2003
3.   Evaluating Software Architectures: Methods and Case Studies, Clements, Kazman, Klien, PEA, 2002
4.   Tutorial on Software Design Techniques, Freeman, Wasserman, A.I.(Es), IEEE, 1980
5.   Design and Use of Software Architectures- Adopting and Evolving a product – Line Approach, Bosch, J., ACM Press , Addison Wesley, 2000
6.   Software Architecture and Design, Bernard Witt, Baker, Merritt, Von Nostrand Reinhold, NY, 1994.

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MC4054 –COMPUTER GRAPHICS AND VISION

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 3	**External Examination**	: 3 Hrs

UNIT - I

Introduction: Application areas of Computer Graphics, Overview of graphics systems, Video-display devices, Raster-scan systems, Random scan systems.
Output primitives : Points and lines, Line drawing algorithms, Mid-point circle and ellipse algorithms. Filled area primitives: Scan line Polygon Fill algorithm, Boundary-fill and Flood-fill algorithms

UNIT - II

2D&3DGeometrical Transformations: Translation, Scaling, Rotation, Reflection and Shear transformations, Matrix representations and homogeneous coordinates, Composite transformations, Transformations between coordinate systems, Cohen-Sutherland line clipping algorithm, Sutherland–Hodgeman polygon clipping algorithm.

UNIT - III

Introduction to Digital Image Processing :Examples of fields that use Digital image processing, Fundamental steps in Digital image processing, Components of image processing system.
Digital Image Fundamentals: A simple image formation model, Image sampling and quantization, Basic relationships between pixels, Color models.

UNIT - IV

Image enhancement in the spatial domain: Basic gray-level transformation, Histogram processing, Enhancement using arithmetic and logic operators, Basic spatial filtering, Smoothing and sharpening spatial filters, Combining the spatial enhancement methods

UNIT - V

Morphological Image Processing: Preliminaries, Dilation, Erosion, Open and Closing, Hit or miss transformation, Basic morphologic algorithms
Image Segmentation: Detection of discontinuous, Edge linking and boundary detection, Thresholding, Region–based segmentation

TEXT BOOKS

1. "Computer Graphics C version", Donald Hearn and M.Pauline Baker, Pearson Education. (Units I & II)
2. Digital Image Processing, RafealC.Gonzalez, Richard E.Woods, Second Edition, Pearson Education/PHI. (Units III,IV & V)

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REFERENES

1. Procedural elements for Computer Graphics, David F Rogers, Tata Mc Graw hill, 2nd edition.
2. Computer Graphics, Steven Harrington, TMH
3. Image Processing, Analysis, and Machine Vision, Milan Sonka, Vaclav   Hlavac and Roger Boyle, Second Edition, Thomson Learning.
4. Introduction to Digital Image Processing with Matlab, Alasdair McAndrew, Thomson Course Technology
5. Computer Vision and Image Processing, Adrian Low, Second Edition, B.S.Publications

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MC451 –ADVANCED JAVA LAB.

Lab.	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 2	External Examination	: 3 Hrs

1.   Write a HTML program to create a Table.
2.   Write a HTML program to create Lists.
3.   Write a HTML program using Frames
4.   Write a HTML program to develop a web page to fill student information
5.   Write a HTML program that use CSS.
6.   Write a HTML program to reverse a given number.
7.   Write a Java script program to find that a given number is prime or not.
8.   Write a Java script program to find that a given number is Armstrong or not.
9.   Write a Java script program to find the factorial of a number using recursion.
10.   Write a Java script program by using Java script Objects.
11.   Write a HTML program that handles the events.
12.   Write an XML program using DTDs
13.   Develop a web page to implement online book stores using XML
14.   Write a Java program to retrieve data from data base using Type-1 and Type-4 drivers.
15.   Write Java program by using Prepared Statements and Callable Statements.
16.   Write a Java program using forward only and bi-directional Resultsets
17.   Write an example program using BDK.
18.   Write a simple Servlet program using Generic and HTTP Servlets.
19.   Write a Servlet program that handles the user request by using doGet () and doPost () methods.
20.   Write a Servlet program using Config and Context parameters.
21.   Write a Servlet program to implement Session Tracking.
22.   Write a Servlet program that uses JDBC.
23.   Write a simple JSP program to display Date.
24.   A) Write a JSP program by using Implicit objects.
      B) Write a JSP program to handle Exceptions.
25.   Write a JSP program using JDBC.
26.   Write a JSP program using Include, Forward requests.
27.   Write a JSP program using useBean.

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MC452 –OBJECT ORIENTED ANALYSIS & DESIGN USING UML LAB.

Lab.	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 2	**External Examination**	: 3 Hrs

Draw Use case, Sequence, Collaboration, Class diagram and Activity diagrams for the following and implement both Forward and Reverse Engineering.

1. Interaction of the user with the Database.

2. Library Information System.

3. University Model

4. Bank Application

5. ATM Transactions

6. Cell Phone Networking System

7. Hospital Management System

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V SEMESTER

MC501 –BUSINESS INTELLIGENCE

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT-I

Introduction
Fundamentals of Data Mining, Data Mining functionalities, Classification of Data Mining Systems, Data mining applications, Data Warehouse and OLAP Technology, Multidimensional data Model, Data warehouse architecture.

UNIT-II

Data preprocessing: Data cleaning, Data Integration and Tranformation, Data Reduction, Discretization and concept Hierarchy generation, Data Mining primitives, Data Generalization and Summerization, Basic Characterization, attribute relevants analysis, Mining descriptive statistical measures, Data Mining query Languages.

UNIT-III

Association Rule Mining & Market Basket Analysis, Efficient and scalable Frequent Item Set Mining methods.(Apriory and FP growth), Mining various kinds of Association rules

UNIT-IV

Classification and Prediction, Classification by Decision tree induction, Bayesian classification, Prediction: Linear regression, Non-Linear regression.

UNIT-V

Cluster analysis: Types of Data in Cluster analysis, Categorization of clustering methods, Partitioning methods, Outlier analysis, Text Mining, Web Mining.

TEXT BOOK

Data Mining ,Concepts and Techniques ,Jiawei Han, MichelineKamber,Harcourt India

REFERENCES

1. Data Mining, Introductory & advanced Topics, Margaret H Dunham, Pearson.
2. Data Mining Techniques, Arun K Pujari, University Press.
3. Data warehousing Fundamentals, PaulrajPonnaiah, Wiley.
4. The Data Warehouse Life Cycle Tool kit, Ralph Kimball, Wiley.

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MC502 –ARTIFICIAL INTELLIGENCE

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 4	**External Examination**	: 3 Hrs

UNIT-I

Introduction:
The AI Problems, The underlying Assumption
Problems, Problem Spaces, and Search:
Defining the problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics, Issues in the Design of Search Programs.
Heuristic Search Techniques:
Generate- and-Test, Hill Climbing, Best-First Search, Problem Reduction, Constraint Satisfaction, Means-ends Analysis.

UNIT-II

Knowledge Representation Issues:
Representations and Mappings, Approaches to Knowledge Representation, Issues in Knowledge Representation.
Using Predicate Logic:
Representing Simple Facts in Logic, Representing Instance and ISA Relationships, Computable Functions and Predicates, Resolution.
Representing Knowledge Using Rules:
Procedural versus Declarative Knowledge, Logic Programming, Forward Versus Backward Reasoning, Matching.

UNIT-III

Symbolic reasoning Under Uncertainty:
Introduction to Nonmonotonic Reasoning, Logics for Nonmonotonic Reasoning, Implementation Issues, Augmenting a problem-solver,
Depth-First search, Breadth-First search.
Statistical Reasoning:
Probability and Baye's Theorem, Certainly Factors and Rule-based Systems, Bayesian Networks.
Weak Slot-and-Filler Structures: Semantic Nets, Frames.
Strong Slot-and Filler Structures: Conceptual Dependency, Scripts.

UNIT-IV

Game Playing:
The Minimax search Procedure, Adding Alpha-beta Cutoffs.
Planning:
An Example Domain: The Blocks World, Components of a Planning System,
Goal Stack Planning.
Natural language Processing, Learning.

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UNIT-V

Expert Systems, Perception and Action
Introduction to Neural Networks:
Biological Neuron structure, Basic Artificial Neuron Models.
Types of Neural Networks, Applications of Neural Networks

TEXT BOOK

ElaineRichKevinKnight, Shivashankar B Nair "Artificial Intelligence", 3rd Edition, TMH, 2010.

REFERENCES

1. Stuart Russell, Peter Norvig, "Artificial Intelligence – A Modern Approach", Second Edition, Pearson Education / Prentice Hall of India, 2004.
2. George F.Luger, "Artificial Intelligence – Structures and Strategies for Complex Problem Solving", Pearson Education / PHI, 2002.

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MC503 –MULTIMEDIA APPLICATION DEVELOPMENT

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 4	External Examination	: 3 Hrs

UNIT – I

Fundamental concepts in Text and Image: Multimedia and Hypermedia, World Wide Web, Overview of Multimedia software tools, Graphics and image data representation, Graphics/image data types, File formats, Fundamental concepts in video and digital audio: Types of video signals, Analog video, Digital video, Digitization of sound, MIDI, Quantization and Transmission of audio.

UNIT - II

ActionScript I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authorizing an ActionScript Class
Action Script II: Inheritance, Authorizing an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

UNIT - III

Application Development: An OOP Application Frame work, Using Components with ActionScriptMovieClip Subclasses. Multimedia data compression, Lossless compression algorithm, Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression,

UNIT - IV

Lossy Compression Algorithm, Quantization, Transform Coding, Wavelet-Based Coding.
Basic Video Compression Techniques: Introduction to video compression, Video compression based on motion compensation, Search for motion vectors, MPEG, Basic Audio Compression Techniques.

UNIT - V

Multimedia Networks: Basics of Multimedia Networks, Multimedia Network Communications and Applications, Quality of Multimedia Data Transmission, Multimedia over IP, Multimedia over ATM Networks, Transport of MPEG-4, Media-on-Demand(MOD).

TEXT BOOK

Fundamentals of Multimedia by Ze-Nian Li and Mark S. Drew, PHI/Pearson Education

REFERENCES

1. Essentials ActionScript 2.0, Colin Moock, SPD O,REILLY.
2. Digital Multimedia, Nigel chapman and jenny chapman, Wiley-Dreamtech
3. Macromedia Flash MX Professional 2004 Unleashed, Pearson.

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MC5041 –DATABASE TUNING

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT-I

Basic Principles : The Power of Principles, Five Basic Principles, Basic Principles and Knowledge, Tuning The Guts , Locking and Concurrency Control, Logging and the Recovery Subsystem, Operating System Considerations, Hardware Tuning.

UNIT-II

Index Tuning, Types of Queries, Key Types, Data Structures, Sparse Versus Dense Indexes, To Cluster or Not to Cluster, Joins, Foreign key Constraints, and Indexes, Avoid Indexes on small Tables.

UNIT-III

Tuning Relational Systems, Table Schema and Normalization, ClusteringTwo tables, Aggregate Maintenance, Record Layout, Query Tuning, Triggers. Communicating with the outside Client-server Mechanisms, Objects, application Tools, and Performance, Tuning the application Interface, Bulk Loading Data, Accessing Multiple Databases.

UNIT-IV

Troubleshooting: Introduction, How to gather Information: The Tools, Queries from Hell, Are DBMS Subsystems Working Satisfactorily, Is the DBMS Getting All It Needs.

UNIT-V

Transaction Chopping : Assumptions, Correct Choppings, Finding the Finest Chopping, Optimal Chopping Algorithm, Application to Typical Database Systems, Related Work.
Time Series, Especially for Finance: Setting up a Time Series Database, FAME,S-Plus, SAS, KDB, Oracle-8i Time Series, features you want for Time Series, Time Series Data Mining.
Understanding access Plans: Data Access Operators, Query structure Operators, Auxiliary Operators.
Configuration Parameters: Oracle, SQL Server, DB2 UDB.

TEXT BOOK

Dennis Shasha and Philippe Bonnet "Database Tuning, Principles, Experiments and Troubleshooting Techniques", Morgan Kaufmann, Elsevier.

REFERENCES

1. Thomas Connoly and CarlolynBegg,"Database Systems, A Practical Approach to Design, Implementation and Management", Third Edition, Pearson Education.
2. M.TamerOzsu, Patrick Valduriez and S.Sridhar "Principles of Distributed Database Systems", Pearson Education.

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MC5042 –OPEN SOURCE SOFTWARE

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 3	**External Examination**	: 3 Hrs

UNIT-I

Open Source Software: Definitions & History- Definitions of terms, A Brief History of Software

Where Open Source Is Successful –Analytical Framework, Open Source in widespread successful use, Examples of Open Source Systems

Open Source: The Good, the Bad, and the Ugly-What is Good about Open source, Open Source is Not enough by itself, How Choosing Open Source Is More difficult for You, What Others Say about Open Source.

UNIT-II

Five Open Source Opportunities – Introduction, Directory Services, Email, Groupware and Collaboration, Complex Web Publishing, Manage User Desktops, Other Possibilities

Operating Systems – Contents of the Operating systems, Linux Distribution Vendors, Enterprise Distribution Vendors, Community-Supported Distribution Vendors, International Alternatives

UNIT-III

Open Source Server Applications – Infrastructure Services, Web Services, Database Servers, Mail Servers, System Management

Open Source Desktop Applications – Introduction, Graphical Desktops, Web Browsers, The Office Suite, Mail and Calendar Clients, Personal Software

UNIT-IV

How Open Source Software is Developed – Methodology, Languages Used to Develop Open source Products, Cross-Platform Code

Application Architecture –Types of Systems, Tiered Design, Managing Performance and Scalability, Interoperability, Development Platform Choices

UNIT-V

Managing System Implementations – Implementation Roles, Open Source Impact on Team Issues, Implementation Process, Implementations Principles, Key Documents, Migration, Interacting with Open Source Community, Support.

The Cost of Open Source Systems- Total Cost of Ownership, Types of Costs, Scenarios

Licensing – Types of Licenses, Licenses in Use, Mixing Open and Closed Code, Dual Licensing, Other Intellectual Property Issues

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TEXTBOOK

Open Source Software Implementation and Management, Paul Kavanagh, Elsevier Digital Press.

REFERENCES

1. Understanding Open Source Software Development, Joseph Feller and Brian Fitzgerald, Addison Wesley Professional 2002.
2. Producing Open Source Software, Karl Fogel, O'reilly-2006.

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MC5043 –SOFTWARE QUALITY MANAGEMENT

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 3	**External Examination**	: 3 Hrs

UNIT - I

Definition of quality, software quality, different views of quality, hierarchical model definition, hierarchical models of Boehm's and McCall, quality criteria interrelation, practical evaluation of quality criteria.

UNIT - II

Measuring quality, quality metrics, problems with metrics, overall measure of quality, work of GILB, the COQUAMO project, recent work on metrics, quality profiles.

UNIT - III

Growth of software engineering methods, methodologies based upon the waterfall life cycle, case tools, contribution of methods and tools to quality, alternate approaches to software development, standards based on software life cycle

UNIT - IV

Elements of QMS, the key to quality management , quality in software, the problem of user requirements, A QMS for software, quality assurance, purpose of standards , THE ISO 9000 series, ISO 9003 standards, impact of ISO9000.

UNIT - V

Capability Maturity Model individual levels of the CMM, role of the CMM, SPICE, four key issues in quality, Are case tools addressing the right issues?, what is the likely impact of standards?, beyond software quality the need for a strategic view.

TEXT BOOK

Software Quality Theory and Management By ALAN C GILLIES, Cengage

REFERENCE

Mordechai Ben – Menachem and Garry S. Marliss "Software Quality, Thomson Asia.

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MC5044 –CLOUD COMPUTING

Lecture	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 3	**External Examination**	: 3 Hrs

UNIT - I

Cloud Computing fundamentals: Essential characteristics, Architectural Influences, Technological Influences, Operational Influences.

UNIT - II

Cloud Computing Architecture: Cloud Delivery models, The SPI Framework, Cloud Software as a Service (SaaS) , Cloud Platform as a Service(PaaS), Cloud Infrastructure as a Service(IaaS), Cloud deployment models, Public Clouds, Community Clouds, Hybrid Clouds, Alternative Deployment models, Expected benefits.

UNIT - III

Cloud Computing Software Security fundamentals: Cloud Information Security Objectives, Confidentiality, Integrity, Availability, Cloud Security Services, Relevant Cloud Security Design Principles, Secure Cloud Software Requirements, Secure Development practices, Approaches to Cloud Software Requirement Engineering, Cloud Security Policy Implementation.

UNIT - IV

Cloud Computing Risk Issues: The CIA Traid, Privacy and Compliance Risks, Threats to Infrastructure, Data and Access Control , Cloud Access Control Issues ,Cloud Service Provider Risks.
Cloud Computing Security challenges: Security Policy Implementation, Policy Types, Computer Security Incident Response Team(CSIRT).

UNIT - V

Cloud Computing Security Architecture: Architectural Considerations, General Issues, Trusted Cloud Computing, Secure Execution environments and Communications, Micro architectures, Identity Management and Access Control, Autonomic Security.

TEXT BOOK

"*Cloud Security A comprehensive Guide to secure Cloud Computing*" by Ronald L. Krutz, Russell Dean Vines, Wiley.

REFERENCES

1. *"Cloud Computing Implementation, Management and Security"* by John W. itinghousejamesF.Ransome, CRC Press.
2. "Handbook of Cloud Computing" by BorkoFurht. Armando Escalante, Springer
3. "Cloud Revolution" , by Charles BadcockMcGrawhill.

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MC5051 –DATABASE ADMINISTRATION

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT-I

Introduction: Database Architecture, DBMS Architecture and Data independance,DBA roles and responsibilities, Logical Database layouts, Physical Database layouts,Hardware Configurations and considerations, Overview of physical and logical storage structures.

UNIT-II

Schema Management,User Management and Database Security, Database creation, Connectivity and User Management, Creating and modifying user accounts, Creating and using Roles, Granting and revoking previliges, Managing user groups with profiles, Managing user and Security, Profiles, Managing previliges.

UNIT-III

Transaction Management, Managing multiple Databases, Managing Rollback statements, Database security and auditing, Introduction to Network administration, Network responsibilities for DBA, Network configuration, Managing large Databases, managing Distributed Databases, Configuring, Client-Server and Network computing. Oracle background processors, Overview of Oracle Net Futures.

UNIT-IV

Backup and recovery : Overview, Database backup restoration and recovery. Types of failures in oracle environment.
Defining backup and recovery strategies : Optimal backup and recovery procedures, Testing the backup and recovery plan.

UNIT-V

Introduction to performance tuning: Improving Database performance, Brief overview of Tuning methodology, An approach to oracle performance, Tuning, Optimizing, Oracle query processing, Query optimization and Oracle cost based Optimizer, The role of DBA to improve SQL processing.

TEXT BOOK

Oracle DBA Handook—Kevin Loney,Oracle press

REFERENCES

1.   Expert Oracle database administration-Sam R Alapati,Apress.
2.   Oracle DBA Bible---Jennick,Carol,Mccullough Dieter,and Gerrit,Jan Linker
3.   Oracle Database The complete reference—Loney Kevin,McGrahill
4.   Oracle DBA fundamentals—Bob Brayela,Biju Thomas,BPV publications

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MC5052 –UNIX ADMINISTRATION

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT - I

Booting and shutting Down: Bootstrapping, Booting Pcs, Booting in Single User mode, Startup Scripts Rebooting and Shutting down.

UNIT - II

Controlling Processes: Components of a process, Life cycle of a process, Signals, Process states.
The File System: Path names, Mounting and unmounting files, Organization of the file tree, File types, File attributes.

UNIT - III

Adding New Users: The /etc/passwd file, Adding users, Removing users, Disabling logins, Configuration of hardwired terminals, Special characters and Terminal driver, How to unwedge a terminal.

UNIT - IV

Adding a Disk: Disk Interfaces, An overview of the disk installation procedure, Periodic Processes.
Backups: Motherhood and apple pie, Backup devices and media, Restoring from dumps, Using other archiving programs.

UNIT - V

Syslog and Log Files: Logging Polices, Finding Log Files, Files not to manage, Syslog.
Drivers and the Kernel: Kernel Types, Configuring a Solaris Kernel, Linux Kernel,Adding Device Drivers, Device Files, Naming Conventions for devices.

TEXT BOOK

E. Nemeth, G. Snyder, S. Seebass and T.R.Hein, "UNIX System Administration Handbook", Pearson Education, 3rd ED.

REFERENCES

1.   Goodheart B. Cox J, "The Magic Garden Explained", Prentice Hall of India.
2.   Leffler S.J., Mckusick M.K., Karels M.J. and QuartermanJ.S.,"The Design and Implementation of the 4.3 BSD Unix Operating System", Addison Wesley.
3.   BehrouzA.Forouzan , Richard Gilberg, " Unix & Shell programming ", Thomson Asia, 2003

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MC5053 –SOFTWARE PROJECT MANAGEMENT

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT-I

Conventional Software Management: Waterfall model, Conventional Software Management performance.
Evolution of Software Economics: Software economics, Pragmatic software cost estimation.
Improving Software Economics: Reducing Software product size, Improving software processes, Improving team effectiveness, Improving automation, Achieving required quality, peer inspections
The Old way and the new: The principles of conventional software Engineering, Principles of modern software management, Transitioning to an iterative process.

UNIT-II

Life cycle phases: Engineering and Production stages, Inception, Elaboration, Construction, Transition phases.
Artifacts of the process: The Artifact sets, Management artifacts, Engineering artifacts, Programmatic artifacts.

UNIT-III

Model based software architectures: A Management perspective and technical perspective.
Work Flows of the process: Software process workflows, Iteration workflows
Checkpoints of the process: Major mile stones, Minor Milestones, Periodic status assessments.

UNIT-IV

Iterative Process Planning: Work breakdown structures, Planning guidelines, Cost and Schedule estimating, Iteration planning process, Pragmatic planning
Project Organization and Responsibilities: Line-of-Business Organizations, Project Organizations, evolution of Organizations.
**Process Automation:** Automation Building blocks, The Project Environment.

UNIT-V

Project Control and Process instrumentation: The seven core Metrics, Management indicators, Quality indicators, Life cycle exceptions, Pragmatic Software Metrics, Metrics automation
Tailoring the Process: Process discriminants.
Future Software Project Management: Modern Project Profile, Next generation Software economics, Modern process transitions.

TEXT BOOK
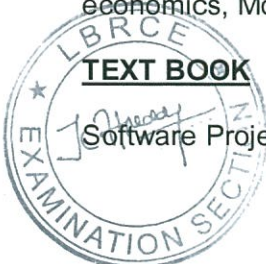
Software Project Management, Walker Royce: Pearson Education, 2005.

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REFERENCES

1. Software Project Management, Walker Royce, Bob Hughes and Mike Cotterell, Tata McGraw-Hill Edition.
2. Software Project Management, Joel Henry, Pearson Education.
3. Software Project Management in practice, PankajJalote, Pearson Education 2005

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MC5054 –PRINCIPLES OF PROGRAMMING LANGUAGES

Lecture	: 4 Periods/week	Internal Marks	: 40
		External Marks	: 60
Credits	: 3	External Examination	: 3 Hrs

UNIT - I

Preliminary Concepts: Reasons for studying, Concepts of programming languages, Programming domains, Language Evaluation Criteria, Influences on Language design, Language categories, Programming Paradigms– Imperative, Object Oriented, functional Programming , Logic Programming. Programming Language Implementation–Compilation and Virtual Machines, programming environments.

UNIT -II

Syntax and Semantics: General Problem of describing Syntax and Semantics, Formal methods of describing syntax - BNF, EBNF for common programming languages features, Parse trees, Ambiguous grammars, Attribute grammars, Denotational semantics and Axiomatic semantics for common programming language features. Names, Variable, concept of binding, type checking, Strong typing, Type compatibility, Named constants, Variable initialization. Data types: Introduction, Primitive, Character, User defined, Array, Associative, Record, Union, Pointer and Reference types, Design and Implementation issues related to these types.

UNIT-III

Expressions and Statements: Arithmetic, Relational and Boolean expressions, Short circuit evaluation, Mixed mode assignment, Assignment Statements. Control Structures – Statement Level, Compound Statements, Selection, Iteration, Unconditional Statements, Guarded commands. **Subprograms and Blocks**: Fundamentals of sub-programs, Scope and lifetime of variable, Static and Dynamic scope, Design issues of subprograms and operations, Local referencing environments, Parameter passing methods, Overloaded sub-programs, Generic sub-programs, Parameters that are sub-program names, Design issues for functions, User defined overloaded operators, Co-routines.

UNIT - IV

Abstract Data types: Abstractions and encapsulation, introduction to data abstraction, Design issues, Language examples, C++ parameterized ADT.
Object oriented programming in C++,Java,
Concurrency: Subprogram level concurrency, Semaphores, Monitors, Message passing, Java threads, C# threads.

UNIT - V :

Exception handling : Exceptions, Exception Propagation, Exception handling in Ada, C++ and Java.
Functional Programming Languages: Introduction, Fundamentals of FPL, LISP, ML, Haskell, Application of Functional Programming Languages and comparison of functional and imperative Languages.
Logic Programming Language : Introduction and overview of logic programming, basic elements of prolog, application of logic programming.

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TEXT BOOK

Concepts of Programming Languages Robert .W. Sebesta 4/e, AddisonWesley

REFERENCES

1. Programming languages –Ghezzi, 3/e, John Wiley
2. Programming Languages Design and Implementation – Pratt and Zelkowitz, Fourth Edition PHI/Pearson Education
3. Programming languages –Watt, Wiley Dreamtech
4. LISP Patric Henry Winston and Paul Horn Pearson Education.
5. Programming in PROLOG Clocksin, Springer

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MC551 –BUSINESS INTELLIGENCE LAB.

Lab.	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 2	**External Examination**	: 3 Hrs

1. Creation and Usage of ARFF files.

2. Develop Weka application to preprocess the Data.

3. Develop Weka application for attribute selection using Filters.

4. Develop Weka application to perform association Mining and categorical Data.

5. Develop Weka applications for various classification algorithms.

6. Develop Weka applications for various clustering algorithms.

7. Develop Weka application to access the data from database.

8. Develop Weka application to visualize the Data in Graphs

9. Develop a Clementine stream to access the data from database.

10. Develop a Clementine stream to access the data from various sources.

11. Develop a Clementine stream for various record options.

12. Develop a Clementine stream to visualize user input Data on Graphs.

13. Develop a Clementine stream to perform Clustering using various algorithms.

14. Develop a Clementine stream to perform Classification using various algorithms.

15. Develop a Clementine stream for various aggregations

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MC552 –MULTIMEDIA APPLICATION DEVELOPMENT LAB.

Lab.	: 4 Periods/week	**Internal Marks**	: 40
		External Marks	: 60
Credits	: 2	**External Examination**	: 3 Hrs

1. Assigning Actions to an Object, and a Button
2. Creating Loops
3. Generation of Random   Numbers
4. Creating a Function, Calling a Function
5. Detecting the Player Version
6. Detecting the Operating System
7. Checking the System language
8. Detecting Display   Settings
9. Tinting a Movie Clip's Colour
10. Controlling a Movie Clip's Colourwith Sliders
11. Drawing a Circle
12. Drawing a Rectangle
13. Filling a Shape with a Gradient
14. Scripting Masks
15. Converting Angle Measurements
16. Calculating the Distance Between Two Points
17. Formatting Currency Amount
18. Converting Between Units of Measurement
19. Determining Points along a Circle
20. Sorting or Reversing an Array
21. Implementing a Custom Sort
22. Creating a Text Field
23. Making a Password Input field

All the above programs are to be done in Flash MX 2004.

REFERENCES

1. Action Script Cookbook, Joey Lott, SPD-Oreilly.
2. Flash MX Action Script for designers, Doug Sahlin, Dreamtech Wiley.
3. Flash MX Professional 2004 Unleashed, David Vogeleer and Matthew Pizzi , Pearson Education.

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