Syllabus of M.C.A. I YEAR

OF

THREE YEAR PG COURSE

IN

MASTER OF COMPUTER APPLICATIONS

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
(Autonomous)
Hyderabad – 500 75

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. I YEAR

MASTER OF COMPUTER APPLICATIONS

I SEMESTER

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction Periods per week L/T	D/P	Scheme of Examination Duration In Hours	Maximum Marks Semester End Exam	Sessionals	CREDITS
		THEORY						
1.	MC111	Discrete Mathematics	4	-	3	75	25	3
2.	MC112	Computer Programming	4	-	3	75	25	3
3.	MC113	Elements of Information Technology	4	-	3	75	25	3
4.	MT511	Probability and Statistics	4	-	3	75	25	3
5	EG611	Soft Skills	4	-	3	75	25	3
		PRACTICALS						
6	MC114	Programming Lab – I (CP Lab)	-	3	3	50	25	2
7.	MC115	Programming Lab – II(EIT Lab)	-	3	3	50	25	2
	Total		20	6		475	175	19

L: Lecture, T: Tutorial, D: Drawing, P: Practical

MC111   **With effect from Academic Year 2013-14**

DISCRETE MATHEMATICS

Instruction   4L periods per week
Duration of University Examination   3 Hours.
University Examination   75 Marks
Internal Examination   20 Marks
Assignment   5Marks
Credits   3

OBJECTIVE:

1. To extend student's Logical and Mathematical ability and to introduce most of the basic terminologies used in computer science with particular reference to the relationships between discrete structures and their data

OUTCOMES:

1. Students would have gained knowledge of the concepts needed to test the logic of a program.
2. Exposure to Boolean algebra, Set concepts, functions, Relations, Generating functions, functions of algebraic structures & Graph Theory

UNIT – I

Fundamentals of Logic : Basic Connectives and Truth Tables, Logical Equivalence, Logical Implication, Use of Quantifiers, Definitions and the Proof of Theorems. **Boolean Algebra** : Switching Functions, Logic gates, Don't Care Condition **Set Theory** : Sets and Subsets, Set operations and the Laws of Set theory Counting and Venn Diagrams.

UNIT – II

Properties of Integers : The well-ordering principle, Recursive definitions, The Division Algorithm, Euclidean Algorithm, Fundamental theorem of arithmetic. **Functions** : Cartesian Product, Functions, Onto Functions, Special Functions, Pigeonhole Principle, Composition and Inverse Functions, Computational Complexity. **Relations**: Partial Order Relations, Lattices, Equivalence Relations and Partitions.

UNIT – III

Principle of Inclusion and Exclusion: Principles of Inclusion and Exclusion, Generalization of principle, Derangements, Rooks Polynomial, Arrangements with Forbidden Positions. **Generating Functions** : Introductory examples, Definitions and examples, Partition o Integers, Exponential generating function, Summation operator.

UNIT – IV

Recurrence Relations: First-order linear recurrence relation, Second-order linear homogeneous recurrence relations with constant coefficients, Non- homogeneous recurrence relations, Divide-and-conquer algorithms. **Algebraic Structures**: Definition, Examples and properties. **Groups**: Definition, Examples and elementary properties Homomorphism, Isomorphism and Cyclic groups.

UNIT – V

Graph Theory: Definitions and examples, Sub graphs, Complements and graph isomorphism, Vertex degree, Planar graphs: Hamiltonian paths and Cycles, Graph coloring. **Trees**: Definitions, Properties and examples, Rooted Trees , Spanning Trees and Minimum Spanning Trees.

Text Book:
1. Ralph P.Grimaldi, "Discrete and Combinatorial Mathematics", Pearson Education, 4th Edition, 2003.

Suggested readings:
1. Kenneth H Rosen, "Discrete Mathematics and its Applications" Tata McGraw Hill, 6th Edition,2007.
2. J.P Tremblay &R.Manohar, "Discrete mathematical Structures with Applications to computer science" McGraw Hill. 1987.
3. Joe L.Mott, A.kandal&T.p.Baker, "Discrete mathematics for compute scientists, & mathematicians", Prentice Hall N.J., 1986
4. Kevin Ferland, "Discrete Mathematics", Houghton Mifflin Company, 2009.

COMPUTER PROGRAMMING

Instruction	4L periods per week
Duration of University Examination	3 Hours.
University Examination	75 Marks.
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. Making the student to learn and write algorithms, flowcharts to various types of problems.
2. Making the student to learn C, C++ and write C, C++ programs to various types of problems.

OUTCOMES:
1. Student has capability to write algorithms, flowcharts to various types of problems.
2. Student has capability to write correct and efficient C, C++ programs to various types of problems.

UNIT – I
Algorithm, flowchart, program development steps, creating and running programs, structure of a C program, character set, keywords, identifiers, basic data types and sizes, Constants, variables, operators, expressions, type conversions, operator precedence and associativity, evaluating expressions, Input-output statements, statements and blocks. Control structures: if and switch statements.

UNIT – II
Loops: while, do-while and for, break, continue. Functions: function basics, parameter passing, block structure, user defined functions, standard library functions, recursive functions, Comparison of Iteration and Recursion, header files, C preprocessor, storage classes- extern, auto, register, static.

UNIT – III
Arrays: concepts, declaration, definition, accessing elements, storing elements, arrays and functions, two-dimensional and multi-dimensional arrays, applications of arrays- binary search and bubble sort. Pointers: concepts, pointers as function arguments, pointer arithmetic, Character pointers and functions, pointers to pointers, pointers and arrays, array of pointers, dynamic memory management functions, command line arguments.

UNIT – IV
Strings: concepts, string I/O operations, string manipulation functions. Structures: declaration, definition and initialization of structures, accessing structures, nested structures, array of structures, structures and functions, pointers to structures, unions, enumerated types, typedef. Files: concepts of a file, text files and binary files, file I/O operations, sequential-access files, random-access files.

UNIT – V

C++: Introduction, reference variables, default arguments, inline functions, function overloading, classes and objects, constructors, destructors, friend functions, operator overloading, this pointer, delete, new.

Text Books:
1. B.A. Forouzan and R.F.Gilberg,"Computer science, A structured programming approach using C", 3rd , Cengage learning.
2. YashwantKanetkar, "Let us C" , BPB Publications.
3. Deitel HM&Deitel PJ, "C How to program" , Pearson education.
4. Pradip D &Manas G, "Programming in C 2/e", Oxford University Press.
5. E Balaguruswamy, "Programming in ANSI C", Tata McGraw-Hill.
6. K R Venugopal& S R Prasad, "Programming with C", Tata McGraw-Hill.
7. YashwantKanetkar, "Let us C++", BPB Publications.
8. E Balagurusamy, "Object Oriented Programming with C++", Tata McGraw-Hill.

Suggested books:
1. BW Kernighan DM Ritchie, "The C programming Language", 2nd Edition, Prentice Hall India.
2. Bjarne Stroustrup, "The C++ programming Language" , 3rd Edition, Pearson education.

ELEMENTS OF INFORMATION TECHNOLOGY

Instruction   4L periods per week
Duration of University Examination   3 Hours.
University Examination   75 Marks.
Internal Examination   20 Marks
Assignment   5Marks
Credits   3

OBJECTIVES
1. Obtain understanding of the concepts of Information Technology and its applications.
2. Become familiar with the use of Basics of Database System &Communication Networks.

OUTCOMES
1. Students will get concepts of Information Technology and its applications.
2. Students will become familiar with the use of Basics of Database System Communication Networks

UNIT -I
Digital Age: Digital basis of computers, Data information, Hardware input, output, memory, communication hardware, software, application software, system software, communications, Five kinds of computers, development in communication technology, Operating Systems: Booting managing storage, resources, files tasks, common operating systems, Windows 95/98, DOS, and Windows -NT .

UNIT -II
Processors: The CPU and main memory, Data representation, micro computer system unit, input & output devices, keyboard, pointing devices, source data entry devices, soft copy output, hardcopy output, more output devices, Diskettes, hard disks, optical disks, flash memory, magnetic tape, compression and decompression.

UNIT -III
Network communications: Voice, Video Voice communication, the internet, the World Wide Web, new internet technologies. Communication channels, networks, conduits of communication, communication networks, local networks, factors affecting communication among devices.

UNIT- IV
Files & Databases: Data storage hierarchy, file management, files management systems, Database management systems, type of database organization, and features of a DBMS. Merits and Demerits, Role of DBA Introduction to MS-Access Creation of Database, Queries,

UNIT -V
Information Systems: Organizations, departments, tasks, Management information systems. Six phases of system analysis and design. Software Development: Programming as a five step

procedures. Security Issues: Threats to computers & Communication systems. Safeguarding computers and communications.

Text Book:
1. Williams B.K. Sawyer et.al., "Using information Technology', 6th Edition, Tata McGraw Hill, 2006.

Suggested Reading:
1. Aksoy&DeNardis" Introduction to Information technology", Cengage Learning,2006.
2. Dennis P. Curtin, Kim Folley, et.al., "Information Technology, The breaking Wave", Tata McGraw Hill, 1998.
3. ITL Edn Solutions Ltd. "Introduction to Information Technology", Education, 2005.

PROBABILITY AND STATISTICS

Instruction	4L periods per week
Duration of University Examination	3 Hours.
University Examination	75 Marks.
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES

1. This course is objected to inculcate the students an adequate understanding of the basic   concepts of probability theory and statistics.
2. To make them develop an interest in the area which may find useful to pursue their studies.

OUTCOMES
1. Student gets an adequate understanding of the basic concepts of probability theory and
2. Statistics and also develops an interest in the area which may find useful to pursue their studies.

UNIT -I
Data Interpretation and Analysis:
Methods of collecting data, analysing data, representation of the data geometrically, statical tools (pie chart, ogive chart and Box-plot diagram), statical measurements (measures of central tendency ,dispersions), Frequency distributions.

UNIT –II
Probability: Laws of probability, conditional probability, Baye's Theorem, random variables, properties, ,Mean, Variance, MGF and CGF of Probability distributions, Bernoulli ,binomial and poisson

UNIT –III Continuous distributions:
Rectangular, Normal, Gamma (one and two parameters) and Beta (first and second kind).

UNIT –IV Statistical methods:
Mathematical Expectation, Moments, Skewness and Kurtosis.
Correlation (bivariate (Raw data,Frequency data))and Linear Regression

UNIT –V: Testing & Inference
Testing of Hypothesis, Introduction to tests of significance, t, χ^2 -tests, testing of two proportions.

Text Books:

1. S.C. Gupta and V.K. Kapoor, "Fundamentals of mathematical Statistics", 1989.
2. Introduction to Proability Models by Sheldon M Ross- Elsevier 11th –edition.
3. Probability and Statistics McGraw Hills-Spiegel ,Srinivasan (Schaum's out lines)

Suggested readings:
1. William Mendenhall, Robert J. Beaver, Barbara M.. Beaver, "Introduction to Probability and Statistics", Thomson Brooks/Cole, Eleventh Edition, 2003.
2. Richard A. Johnson, "Probability and Statistics for Engineers", Prentice Hall of India, Seventh.
3. Probability and Statistics for computer Science by John Willey Publishers.

SOFT SKILLS

Instruction	4L periods per week
Duration of University Examination	3 Hours.
University Examination	75 Marks.
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES :
1. To develop oral and written communication skills.
2. To enable the participants to present their ideas logically and effectively.
3. To make students aware of business communication. To hone basic communication skills (Listening, Speaking, Reading, Writing) of the students by exposing them to the key communication techniques.
4. To enable students to know the functional aspects of English language like introductions descriptions requests etc.

OUTCOMES:
1. Student develops oral and written communication skills. Student learns various types of communication.
2. The student also learns various functional aspects of English language like introductions, descriptions and request.

UNIT -I
Meaning ,definition, Nature and Scope of Communication, Importance of Communication, Process of Communication, Barriers to Effective Communication, Overcoming the Barriers, Non Verbal Communication, Body Language, focus on English skills – Vocabulary, Grammar, Phonetics.

UNIT- II
Employment Communication Resume Styles, Resume Writing, Elements of an Effective Resume Writing, Application Letters, Job Interview – Purpose, Types, Interview Skills – Before during and after the Interview, Interview dressing, Mock Interviews – following up an Application, Accepting an interview invitation, Following up an interview, Accepting Employment, Resigning from a job.

UNIT -III
Introduction to Personality Development, Elements of a good Personlity, Importance of Soft Skills; Introduction to Corporate culture, Professionalism in Service Industry, Group discussions – structure and types, Mock GD using video samples.

UNIT -IV
Presentation Skills and techniques, Personal Grooming and business etiquettes, corporate etiquette, social etiquette and telephone etiquette, role play and body language, impression management.
Sharpening public speaking skills: preparing, rehearsing and integrating, organizing key point s into a coherent story, Dealing with nervousness and anxiety, Delivering dynamic, effec

tive presentations that are concise and clear, Strong openings and closings: Some Tech niques   - Speaking publicly   in   convincing,   confident and concise style, Building rapport   with the audience: eye contact, vocal delivery and body language Some use ful techniques: interactive questions, animations, visuals and multimedia etc.

UNIT- V
Business Reports :   Types and Characteristics, Components of a formal Report, Business Proposals –   Types,   Contents,   Elements.   Writing   to   the   audience's needs, Writing persuasive, clear and concise messages, Letter Writing, Application Writing, Report Writing, Technical Description, Paragraph Development –
 Coherence: Topic Sentence, Supporting Sentence, Authentication and Examples .

Text Books:
1. MatilaTreece : Successful Communication, Allyun and Bacon Pubharkat.
2. BovesThill Business Communication Today Mcycans Hills Publication
3. Dark Studying International Communication Sage Publication
4. Murphy Hidderandt Thomas Effective Business Communication McGraw Hill.
5. K. R. Lakshminarayan: English for Technical Communication, Scitech Publications, Chennai.
6. Abbs Brian & Ingrid Freebairn: Building Strategies, Longman 1979.

PROGRAMMING LAB –I

Instruction	3 Periods per week
Duration of University Examination	3 Hours
University Examination	50 Marks
Sessional	25 Marks
Credits	2

OBJECTIVE:
1. Obtain understanding of the concepts of basics of computer programming. Practicing computer programs through languages like C and C++.

OUTCOMES:
1. At the end of the course, students should be able to: Learn C and C++ programming environment, Mathematical oriented programming and basics of custom oriented applications.

C-PROGRAMS:
1. Write a program to calculate the area of a circle, rectangle, square and triangle.
2. Write a program to find the Roots of a Quadratic Equation.
3. Write a program, which takes two integer operands and one operator form the user, performs the operation and then prints the result. (Consider the operators +,-,*, /, % and use Switch Statement).
4. Write a program to find max, min and sum of given set of numbers.
5. Write a program to find the sum of individual digits of a positive integer.
6. Write a program to find the factorial of a given positive number.
7. A Fibonacci sequence is defined as follows: the first and second terms in the sequence are 0 and 1. Subsequent terms are found by adding the preceding two terms in the sequence. Write a C program to generate the first n terms of the sequence.
8. Write a program to generate all the prime numbers between 1 and n, where n is a value supplied by the user.
9. Write a program to find the reverse of the given positive integer.
10. Write a program to find the sin(x) value using series expansion. (Hint: $\sin(x) = x - x^3/3! + x^5/5! - \ldots$)
11. Write a program to find the cos(x) value using series expansion. (Hint: $\cos(x) = 1 - x^2/2! + x^4/4! - \ldots$)
12. Write programs for the following using recursive and non-recursive functions.
    i)   To find the factorial of a given integer.
    ii)   To find the GCD (greatest common divisor) of two given integers.
13. Write programs using functions to perform the following.
    i) Linear search Technique
    ii) Binary search Technique
14. Write a program to implement bubble sort technique.
15. Write programs using functions to perform the following.
    i) Addition of Two Matrices
    ii) Multiplication of Two Matrices
    iii) Transpose of a given Matrix
16. Write a program to demonstrate call by reference.

17. Write a program to display the array elements from last index to firstindex and display the elements sum.
18. Write a program to find the number of characters, words and sentences in the given string.
19. Write a program to concatenate two strings without using strcat library function.
20. Write a program that uses functions to perform the following operationsusing Structure complex.
    i) Reading a complex number
    ii) Displaying a complex number
    iii) Addition of two complex numbers
    iv) Multiplication of two complex numbers
21. Write a program which counts number of characters, words and lines in file.
22. Write a program which copies one file to another file.
23. Write programs to demonstrate sequential access and random access files.

C++ PROGRAMS:

24. Write a program to demonstrate Reference Variables, default arguments and inline functions.
25. Write programs to demonstrate function overloading.
26. Write programs to demonstrate classes.
27. Write programs using operator overloading.
28. Write a program to demonstrate friend function.

Text Books:
1. E Balaguruswamy, "Programming in ANSI C", Tata McGraw-Hill.
2. K R Venugopal& S R Prasad, "Programming with C", Tata McGraw-Hill.
3. YashwantKanetkar, "Let us C++", BPB Publications.

PROGRAMMING LAB –II   (EIT Lab)

Instruction   3 Periods per week
Duration of University Examination   3 Hours
University Examination   50 Marks
Sessional   25 Marks
Credits   2

OBJECTIVES:
1. Obtain understanding of the concepts of Hardware of a computer system. Become familiar with the use of Information Technology and tools.

OUTCOMES:
2. Learn the concepts of Hardware and its concepts. Learns MS-Office tools like MS-Word, MS-Excel, MS-Powerpoint and Ms-Access.

1. Identify and describe the relationships and role of the components of the "Logical' Diagram of the computer. (e.g. processor, RAM, ROM, BIOS, input, output, storage.)
2. Relate the "logical" diagram of a computer system to the "physical" system by Identifying physical components of a computer and describing their purpose. (e.g. the Processor, memory chips, motherboard, disk drives, and controller cards such as AGP Board, network cards, sound card, as well as parallel and serialports etc.)
3. Assemble the computer which they will use and load the OS with partitions for Windows and Linux, configure for network connection
4. Troubleshoot his/her PC from time to time
5. Install/Uninstall SW/HW on his/her PC from time to time
6. Identify and distinguish between various types of application software. by describing and using them. (e.g. word processor, spreadsheet, database, browser, mailers etc.)
7. MS Word: Create documents with standard formatting commands, single/multi Column, insert pictures/objects, drawings, hyperlinks, header/footer, and tables. No Macros.
8. MS Power Point: Create presentations with preset animations, using different layouts, Backgrounds, slide master, insert pictures/objects, drawings, hyperlinks, header/footer, Tables
9. MS Excel: Creating worksheets with various kinds of data, making charts, conditional Formatting, awareness of the various functions- statistical, date/time, math/trig etc, ability to explore (help) and use these functions if need be, demonstration through some Common functions like sum, average, standard deviation, logical and information.
10. Distinguish between various commercially available systems by relating the cost to Features available on each system
11. MS-Access: Create database for student information, library information and inventory. Generation of queries, reports and transaction processing.

Text Book:

1. Williams B.K. Sawyer et.al., "Using information Technology', Sixth Edition, Tata McGraw Hill, 2006.

Suggested reading:

1. Aksoy&DeNardis" Introduction to Information technology", Cengage Learning,2006.
2. Dennis P. Curtin, Kim Folley, et.al., "Information Technology, The breaking Wave", Tata McGraw Hill, 1998.
3. ITL Edn Solutions Ltd. "Introduction to Information Technology", Education, 2005.

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. I YEAR
MASTER OF COMPUTER APPLICATIONS

II SEMESTER

Sl. No.	Syllabus Ref. No.	SUBJECT	Scheme of Instruction Periods per week		Duration In Hours	Scheme of Examination Maximum Marks		
			L/T	D/P		Semester - End Exam	Sessionals	Credits
		THEORY						
1.	MB721	Managerial Economics & Accountancy	4	-	3	75	25	3
2.	MC121	Data Structures using C ++	4	-	3	75	25	3
3.	MC122	Computer Organization	4	-	3	75	25	3
4.	MC123	OOP Through Java	4	-	3	75	25	3
5.	MC124	Operations Research	4	-	3	75	25	3
		PRACTICALS						
6.	EG621	Advanced English communication skills Lab	-	3	3	50	25	2
7	MC125	Programming Lab – III (DS Lab)	-	3	3	50	25	2
8.	MC126	Programming Lab – IV(Java Lab)	-	3	3	50	25	2
	Total		20	9		525	200	21

L: Lecture, T: Tutorial, D: Drawing, P: Practical

MANAGERIAL ECONOMICS AND FINANCIAL ANALYSIS

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

OBJECTIVES:
1. To enable the student to understand economic concepts and theory and their application in management decision making
2. To provide the basic inspirits on maintaining books of accounts and create awareness on contemporary issues in accounting essential readings.

OUTCOMES:
1. Understand Basics of Managerial Economics.
2. Get the various types of Demand and its exceptions and also Methods of demand forecasting.
3. Understand the various factors of production and Managerial applications
4. Gets how to prepare the financial accounting of a company through examples.
5. Get the various methods of capital budgeting through examples.

UNIT- I
INTRODUCTION TO MANAGERIAL ECONOMICS : Definition, Nature and Scope of Managerial Economics, Micro Economics vs Macro Economics. Relationship of Managerial economics with other disciplines- Mathematics, Statistics, Accounting, and Operations Research. Role and responsibilities of Managerial economist in Business decisions. Fundamental concepts of Managerial economics-Opportunity cost concept, Principle of Time perspective, Incremental principle, discounting principle, and Equi-marginalism.

UNIT- II
DEMAND ANALYSIS : Meaning of Demand, Determinants of demand, types of demand, Individual vs Market Demand, Demand schedule, Demand curve and Demand function. Law of Demand and its exceptions. Elasticity of Demand- Definition, Types, and Measurement of Elasticity of Demand. Demand Forecasting- Factors governing demand forecasting, Methods of demand forecasting (Survey method, Statistical method, Expert opinion method, Test marketing, and judgmental approach)

UNIT- III
PRODUCTION ANALYSIS: Concept and Meaning of production-Factors of production, Production Function, law of variable proportions (with one variable and two variable inputs), ISO-quants and ISO-costs, Laws of returns, Economies and dis Economies of scale - internal and external economies.
COST ANALYSIS: Cost concepts-Actual vs opportunity cost, Incremental and sunk cost ,Short run and long run cost , Fixed and variable cost. Cost output relationship in short -run and long-run. Break Even analysis (BEA) – Break even chart, Determination of Break Even

Point (simple numerical problems) Margin of safety. Managerial applications, and limitations of BEA.

UNIT- IV
INTRODUCTION TO FINANCIAL ACCOUNTING : Definition, Concepts and conventions of Accounting, Principles of double entry book keeping, Preparation of journal, ledger and Trial balance. Preparation of Financial statements- Trading and profit and loss account, and Balance sheet with simple adjustments. Financial statement analysis through Ratios.

UNIT- V
CAPITAL MANAGEMENT AND CAPITAL BUDGETING : Significance of capital, Types of capital and sources of capital. Meaning of capital budgeting, Importance of capital budgeting. Methods of capital budgeting- Pay back period method, Average rate of Return (ARR), Net present value method (NPV) Internal rate of return method (IRR) Profitability Index. (Simple Numerical Problems).

Text Books:
1. P.L. Mehta,"Managerial Economics – Analysis, Problems and Cases" 2011, sultan chand & sons Educational Publishers. (For Units : I , II and III)
2. Grawal T.S, Introduction to Accountancy", 2009 S.Chand Publishers. (For Unit : IV)
3. Pandey, I.M, Financial management, 2010, 10th Edition, Vikas Publishing House. (For Unit : V)

Suggested Readings:
1. Varshney R.L. K.L. Maheswari Managerial economic, Sultan Chand.
2. J.C.Pappas and E.F Brigham, Managerial economics.
3. Maheswari, S.N, Introduction to Accountancy, Vikas Publishing House, 2005.
4. M. Kasi Reddy &S,Saraswathi, Managerial economics & Financial Accounting, PHI 2007.
5. A.R. Aryasri, Managerial economics & Financial Analysis, Tata Mc. Graw Hill, 2006.

DATA STRUCTURES USING C ++

Instruction   4L periods per week
Duration of Main Examination   3 Hours.
Main Examination   75 Marks
Internal Examination   20 Marks
Assignment   5 Marks
Credits   3

OBJECTIVES:
1. To improve the programming skills in C++
2. To gain the knowledge of different types of data structures to store the data.

OUTCOMES:
1. Get the knowledge of how to create a classes and different types of inheritances.
2. Understand the concepts of different linear data structures to store data and their performance.
3. Learn the different sorting techniques and their performances and different hashing mechanisms.
4. Know the different tree structures to store data and concept of AVL trees, binary trees.
5. Learn the graph traversals and spanning trees.

UNIT- I
C++ CLASS OVERVIEW : Class Definition, Objects, Class Members, Access Control, Class Scope, Constructors and destructors, friend functions, dynamic memory allocation and De allocation (new and delete). Function and class templates, Inheritance basics, base and derived classes, inheritance types, base class access control.

UNIT- II
SPARSE MATRIX : Representation and its efficiency in storage.
STACKS: Definition and Operations and Applications, Array and Linked Representation of Stacks.
QUEUES : Definition and Operations. Array and Linked Representation of Queues and their Applications.
LINKED Lists : Definition and Operations, Double linked list representation, Circular linked lists.

UNIT- III
SORTING : Bubble sort, Merge Sort, Selection Sort, heap sort, Quick sort, Insertion sort , Posterior Analysis, Sequential Search, binary search.
HASHING : Hash table, its implementation, Hash table representation, types of hashing, collision resolution techniques.

UNIT- IV
TREES : Definitions and Properties, Representation of Binary Trees, Operations. Binary TreeTraversal, Binary search trees, operations- insertion, deletion and searching, heap trees. AVL Tress and Operations on AVL Trees. B-Trees and its operations.

UNIT- V
GRAPHS : Definition and representation of graphs, data structures for representing graphs-edge list structures, adjacency list structures, adjacency matrix, Graph traversals – BFS and DFS. Spanning trees, minimum spanning trees, prim's and kruskal's algorithms.

Text Books:
1. Object Oriented Programming with C++, E. Balaguru Swamy, Tata McGraw Hill, 4th Edition (For Unit : I)
2. Data structures , Algorithms and Applications in C++, S.Sahani, Universities Press. 2nd Edition. (For Units : II, IV and V)
3. Data structures using C and C++, Langsam, Augenstein and Tanenbaum, PHI. 2nd Edition (For Units : II and III)

Suggested Readings:
1. Data structures and Algorithms in C++, Michael T.Goodrich, R.Tamassia and D.Mount, Wiley student edition, seventh edition, John Wiley and Sons.
2. Data structures and Algorithm Analysis in C++, Mark Allen Weiss, 3rd Edition, Pearson Education. Ltd.

COMPUTER ORGANIZATION

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. Students will learn various techniques to utilize the resources in the organization effectively.
2. Students will learn various topics pertaining to the fundamental concepts of Computer Organization as well as in depth concepts of Computer Architecture inclusive of state of modern art of learning and understanding of the concepts of Parallel processing.

OUTCOME:
1. Understand the representations of number into machine
2. Understand the basic computer organization and its design
3. Understand the components of CPU and its functionality
4. Understand the input–output and memory organization
5. Understands Parallel processing and its environment.

UNIT -I
DATA REPRESENTATION: Data types, Complements, Fixed and Floating Point Representation, Other binary codes and error Detection codes.
DIGITAL LOGIC CIRCUITS: Digital Computers, Logic Gates, Boolean algebra, Map Simplification, Combinational Circuits, Flip Flops, Sequential Circuits.
DIGITAL COMPONENTS: Integrated Circuits, Decoder, Multiplexers, 'Registers, Shift Registers, Binary counter, Memory unit.

UNIT -II
REGISTER TRANSFER AND MICRO OPERATIONS: Register Transfer language, Register transfer, Bus and Memory Transfer, Arithmetic Micro operations, Logic Micro operations, Shift Micro operations and Arithmetic logic shift unit.
BASIC COMPUTER ORGANIZATION AND DESIGN: Instruction codes, Computer Registers, Computer Instructions, Timing and Control, Instruction Cycles, Memory Reference Instructions, Input, Output and Interrupts, Design of Accumulator logic.

UNIT -III
CENTRAL PROCESSING UNIT: Micro programmed Control, Control Memory, Address Sequencing, Micro program Example, Design of Control Unit. General Register Organization, Stack Organization, Instruction Formats, Addressing Modes, Data Transfer and Manipulation, Program Control.

UNIT -IV

INPUT–OUTPUT AND MEMORY ORGANIZATION: Peripheral Devices, I/O output interface, Asynchronous data transfer, Modes of transfer, Priority Interrupt, DMA, Input output Processor, Serial Communication. : Memory Hierarchy, Main Memory, Cache Memory.

UNIT -V
PARALLEL PROCESSING: Trends of Parallel Processing, UniProcessor Architecture, Parallel Processing Mechanism, Multi Programming and Time Sharing, Pipeline Computers, Array Computers, Multi-Processor Systems, Serial Vs Parallel Processing, Parallelism Vs Pipelining.

Text Books:
1. M. Morris Mano, "Computer System Architecture", Pearson Asia / Prentice Hall, Third   edition. (For Units : I,II,III and IV)
2. Kai Hwang and Faye A.Briggs, "Computer Architecture and Parallel Processing" International Edition (For Unit : V)

Suggested Reading:
1. William Stallings, "Computer Organization & Architecture", Pearson Education, Sixth
    Edition, 2003.

OBJECT ORIENTED PROGRAMMING THROUGH JAVA

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

OBJECTIVES:
1. Students will learn about java basics& OOPS concepts.
2. Students will learn the concepts of interfaces, packages.
3. Students will learn the concept of Exception handling in java, Multithreading.
4. Students will learn the I/O package, applets and AWT.

OUTCOMES:
1. Understands the Object oriented programming concepts
2. Gets the advantages of classes and objects
3. Understands Multithreading and exception handling
4. Understand the role of Strings and I/O in applications
5. Understand GUI And Event Driven Programming

UNIT -I
OBJECT ORIENTED PROGRAMMING: History of java, and evolution of java, java Buzzwords, Object Oriented Programming, Data types, Variables and Arrays, Operators, Control Statements,

UNIT -II
INTRODUCTION TO CLASSES: Classes, Methods, Constructors, Destructors, This keyword, finalize method, Garbage Collection, Overloading, Overriding, Recursion, nested Classes,
INHERITANCE: Inheritance and its types, super, overriding, Abstract Classes, Using final.
PACKAGES AND INTERFACES: packages, Access protection, Importing packages, Implementing Interfaces

UNIT -III
EXCEPTIONAL HANDLING: Exception–handling fundamentals, Exception types, Using try and Catch, throw, throws and finally clauses.
MULTITHREADED PROGRAMMING: java Thread Model, Differences between multiple processes and multiple threads, thread states, creating threads, interrupting threads, thread priorities, synchronizing threads, inter thread communication.

UNIT IV
STRING HANDLING: String length, Special String operations, string comparison, Primitive type wrappers
JAVA I/0 classes and Interfaces, Files, Stream and Byte Classes, Character Streams, Serialization.

UNIT –V

GUI AND EVENT DRIVEN PROGRAMMING: Applet Class, Event Handling, Delegation event model, event classes, event listener Interfaces.

USING AWT CONTROLS, LAYOUT MANAGERS AND MENUS: AWT classes, Window fundamentals, labels, Buttons, Checkboxes, lists etc, layout managers, Handling Events by extending AWT components.

Text Books:
1. Patrick Naughton" JAVA , The Complete Reference " Tata McGraw Hill, 4th Edition 2005. (For Unit : I,II,III and IV)
2. Richard A.Johnson,"Java Programming and Object-Oriented Application Development" Cengage Learning, India edition 2009. (For Unit : V)

Suggested Reading:
1. John Dean and Raymond "Introduction Programming with Java A problem solving approach", McGraw Hill 2008.
2. Joe Wigglesworth and Paula McMillan, "Java Programming: Advanced Topics" Cengage Learning. 3rd Edition 2009.

OPERATIONS RESEARCH

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

OBJECTIVES:
1. Students learn various techniques to utilize the resources in the organization effectively.
2. Students learn various methods to maximize the profit and minimize the cost in the organization.
3. This course is useful to the manager of the organization to manage the resources efficiently.

OUTCOMES:
1. Students understand various techniques in utilization of the organization resources.
2. Students learn various methods to maximize the profit and minimize the cost in the organization.
3. The course is useful to manage the organization effectively.

UNIT -I
LINEAR PROGRAMMING: Introduction, Concepts of Linear Programming Model, Development of LP models, Graphical Method, Linear Programming Methods, Special cases of Linear Programming, Duality.

UNIT -II
TRANSPORTATION PROBLEM: Introduction, Mathematical Model for Transportation Problem, Types of Transportation problem, Methods to solve Transportation Problem, Transshipment Model.

UNIT -III
ASSIGNMENT PROBLEM: Introduction, Zero-One Programming Model for Assignment Problem, Types of Assignment Problem, Hungerian Method, Branch-and-Bound Technique for Assignment Problem.
INTEGER PROGRAMMING: Introduction, Integer Programming Formulations, The cutting-plane algorithm, Branch-and-Bound Technique.

UNIT-IV
DYNAMIC PROGRAMMING: Introduction, Applications of Dynamic Programming, Solution of Linear Programming Problem through Dynamic Programming.

UNIT-V
GAME THEORY: Introduction, Game with Pure Strategies, Game with Mixed Strategies, Dominance Property, Graphical Method for 2 X n or m x 2 Games, Linear Programming Approach for Game Theory.

Text Books:
1. Panneerselvam "Operations Research", Second Edition, PHI, 2006.

Suggested Reading:
1. Prem Kumar Gupta and DS Hira, "Operations Research", S.Chand, 2011.
2. JK Sharma, "Operations Research Theory and Applications", Fourth Edition, MacMillan, 2010.
3. Rathindra P sen, "Operations Research- Algorithm and Application", PHI, 2010.
4. K.Swarup, P.K. Gupta and Man Mohan "Operations Research" Sultan Chand & Sons, 2012.

ADVANCED ENGLISH COMMUNICATION SKILLS LAB

Instruction   3 periods per week Exam
Examination   3 Hours
Main Examination   50 Marks
Sessional   25 Marks
Credits   2

OBJECTIVES :
This lab focuses on enhancing the communication skills of the students with the following
objectives:
1. To make students recognize the sounds of English through Audio-Visual aids and
   Computer Software and to enable them to speak English correctly with focus on stress
   and intonation.
2. To help them overcome their inhibitions and self- consciousness while speaking in
   English and to build their confidence. The focus shall be on fluency rather than
   accuracy.
3. To improve the students' fluency in English, through a well-developed vocabulary
   and enable them to listen to English, spoken at normal conversational speed by
   educated English speakers and respond appropriately in different socio-cultural and
   professional contexts.
4. To help the students participate in Group Discussions and to make effective
   presentations.
5. To groom the students for interviews – preparation, planning for an interview, process
   of interview and interview techniques.

EXERCISE 1:
Functional English – Starting a conversation – responding appropriately and relevantly –
using the right body language – role play in different situations.
Vocabulary Building – synonyms and antonyms, word roots, one-word substitutes, prefixes
and suffixes, study of word origin, analogy, idioms and phrases.

EXERCISE II :
Group Discussion – dynamics of group, intervention, summarizing, modulation of voice,
body language, relevance, fluency and coherence.
Presentation Skills – Oral presentations (individual and group) through JAM
sessions/seminars and written presentations through posters/projects/reports/PPTs/e-
mails/assignments etc.

EXERCISE III :
Interview Skills – concept and process, pre-interview planning, opening strategies, answering
strategies, interview through tele and video-conferencing.

EXERCISE IV :
Introduction to the Sounds of English- Vowels, Diphthongs & Consonants. Introduction to
Stress and Intonation.

<u>EXERCISE V :</u>

Debate ,Telephoning Skills, Oral Presentations- Prepared and Extempore. 'Just A Minute'
Sessions (JAM). Describing Objects / Situations / People.

Text Books:
1. Technical Communication by Meenakshi Raman & Sangeeta Sharma, Oxford University Press, 2009.
2. Advanced Communication Skills Laboratory Manual by Sudha Rani, D, Pearson Education, 2011.
3. English Language Communication: A Reader cum Lab Manual Dr A Ramakrishna Rao, Dr G Natanam & Prof S A Sankarnarayanan, Anuradha Publications, Chennai 2008.
4. English Vocabulary in Use series, Cambridge University Press, 2008
5. Management Shapers Series by Universities Press (India) Pvt. Ltd.
6. Communications Skills by Leena Sen, PHI Learning Pvt. Ltd., New Delhi, 2009.
7. Job Hunting by Colm Downes, Cambridge University Press 2008.

DATA STRUCTURES LAB USING C++

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

LIST OF SAMPLE PROBLEMS/EXPERIMENTS:

1.Write a C++ program to illustrate the concept of Class with Constructors, Methods.

2.Write a C ++ program to illustrate the concept of Inheritance.

3.Write a C++ programs for implementing Stack using following:
   a) Arrays
   b) Linked Lists
4. Write a C++ programs for implementing Queues using following:
   a) Arrays
   b) Linked Lists
5. Write a C++ programs for implementing Linked Lists:
   a) Single Linked Lists
   b) Double Linked Lists
   c) Circular Linked Lists
6. Write a program for infix to postfix conversion.

7. Write a C++ program for implementing Binary Search Trees.

8. Write a C++ program for implementing Hashing.

9. Write a C++ program for implementing Quick Sort.

10. Write a C++ program for implementing Selection Sort.

11. Write a C++ program for implementing Merge sort.

12. Write a C++ program for implementing Graph Traversals DFS and BFS.

Text Books:
1. Complete reference to C++, 4th Edition, Herbert Schildt.
2. Advanced Data structures & Algorithms in C++,V.V.Muniswamy,Jaico Publishing House.
3. Data structures via C++,A.M.Berman, Oxford University Press.

JAVA PROGRAMMING LAB

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

LIST OF SAMPLE PROBLEMS/EXPERIMENTS:

1. Write a program to perform different types of functions.

2. Write a program to create classes

3. Write Programs using constructor and destructor

4. Write programs using function overloading

5. Write Programs using inheritance

6. Write programs on interfaces

7. Write programs on packages

8. Write programs on Exception handling

9. Write programs on Multithreading

10. Write Programs using I/O streams

11. Write Programs using files

12. Write programs on applets

13. Write a program using exception handling mechanism

14. Write Programs using AWT

Text Books:
1. Patrick Naughton "Java , The Complete Reference" Tata McGraw Hill 2005.
2. Richard A.Johnson, "Java Programming and Object-Oriented Application Development" Cengage Learning, India edition 2009.

Syllabus of M.C.A. II YEAR

OF

THREE YEAR PG COURSE

IN

MASTER OF COMPUTER APPLICATIONS

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
(Autonomous)
Hyderabad – 500 75

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. II YEAR
MASTER OF COMPUTER APPLICATIONS

I SEMESTER

Sl. No	Syllabus Ref. No.	SUBJECT	Scheme of Instruction — Periods per week		Scheme of Examination — Duration in Hours	Scheme of Examination — Maximum Marks — Semester End Exam	Scheme of Examination — Maximum Marks — Sessionals	Credits
			L/T	D/P				
THEORY								
1	MC211	Software Engineering and Information Systems	4	-	3	75	25	3
2	MC212	Design & Analysis of Algorithms	4	-	3	75	25	3
3	MC213	Database Management System	4	-	3	75	25	3
4	MC214	Operating Systems	4	-	3	75	25	3
5	MB215	Organizational behavior	4	-	3	75	25	3
PRACTICALS								
6	MC215	Technical Report Writing	-	3	3	50	25	2
7	MC216	Database Management System Lab	-	3	3	50	25	2
8	MC217	Operating System Lab	-	3	3	50	25	2
	TOTAL		**20**	**9**	**-**	**525**	**200**	**21**

L: Lecture, T: Tutorial, D: Drawing, P: Practical

SOFTWARE ENGINEERING AND INFORMATION SYSTEMS

Instruction   4L periods per week
Duration of Main Examination   3 Hours.
Main Examination   75 Marks
Internal Examination   20 Marks
Assignment   5Marks
Credits   3

OBJECTIVES:
1. To provide the concepts of management information systems and enterprise management systems.
2. To enable the student to understand the principles of software engineering concepts.

OUTCOMES:
1. Student understands the basic concepts and applications of software engineering principles.
2. Students also gain various management principles of information systems.

UNIT-I
Introduction to Management Information Systems and its level. Knowledge management in the organization, enhancing management decision making, information system and control, managing infrastructure and Enterprise system. GDSS, Decision support systems and its applications.

UNIT-II
Introduction to Software Engineering: Software Engineering Challenges, Software Engineering approach, Software Process, Waterfall, Iterative, Prototype, Incremental, Spiral, Modols.

UNIT- III
Software Requirement Analysis and specification: Software Requirements, Need for SRS, Problem analysis, Requirements specification, IEEE format of SRS Software Architecture: Role of Software Architecture, Architecture views, Component and Connector view.

UNIT-IV
Function Oriented Design: Design Principles, Module-level concepts, Design notations and specifications, structured design methodology, Risk Engineering - Risk Analysis and Management. Effort & Schedule Estimation, Software Project Estimation, COCOMO, Function Point Analysis.

UNIT-V
Testing Techniques & Strategies: white box, black box, basis path testing, Unit testing, Integration testing, Validation testing & System Testing. Software Maintenance, Maintenance activities, Software Reengineering, Reverse Engineering, Forward Engineering.

Text Books:
1. Robert Schuletheis, Mary Summer, "Management information systems- The Manager's view", Tata McGraw Hill, fourth Ed. 2006.(**UNIT : I**)
2. Roger S, Pressman, "Software Engineering: A Practitioner's Approach", 6thEdition, Tata McGrawHill, 2010. (**UNITS : II, III, IV and V**)

Suggested Readings:
1. Kenneth C.Loudon, Jane P Laudon, "Management information system", Prentice Hall, 2008.
2. Pankaj Jalote, "An Integrated Approach to Software Engineering", 3rd edition, Narosa Publishing House, 2010.

With effect from Academic Year 2014-15

DESIGN AND ANALYSIS OF ALGORITHMS

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

OBJECTIVES:
1. To enable the student to understand the principles of algorithm concepts.
2. To provide the understanding concepts of various strategies to solve problems.

OUTCOMES:
1. Apply the algorithms and design techniques to solve problems.
2. Analyze complexities various problems in different domains.

UNIT-I
Introduction: Algorithm: Definition, Specification, Performance Analysis.
Elementary Data Structures: Stacks and Queues, Trees, Dictionaries, Priority Queues, Sets & Disjoint Set Union, Graphs.

UNIT-II
Divide and Conquer: General Method, Binary Search, Finding Maximum and Minimum, Merge Sort, Quick Sort and Selection, Strassen's Matrix Multiplication.
Greedy Method: Knapsack Problem, Tree Vertex Splitting, Job Sequencing with Deadlines, Minimum Cost Spanning Trees, Optimal Storage on Tapes, Optimal Merge Pattern.

UNIT-III
Dynamic Programming: General Method, Multistage Graphs, All Pairs Shortest Path, Single Source Shortest Paths, Optimal Binary Search Trees, 0/1 Knapsack, Reliability Design, Traveling Salesmen Problem
Basic Traversal and Search Techniques: Techniques for Binary Trees, Techniques for Graphs, Connected Components, and Spanning Trees, Biconnected Components and DFS.

UNIT-IV
Back Tracking: General Method, 8-Queen's Problem, Sum of Subsets, Graph Coloring, Hamiltonian Cycles, Knapsack Problem.
Branch Bound: The Method 0/1 Knapsack Problem, Traveling Salesperson.

UNIT -V
NP-Hard and NP-Complete Problems: Basic Concepts, Cook's Theorem, NP-Hard Graph Problems and NP-Hard Scheduling Problems. NP-Hard Code Generation, Some Simplified NP-Hard Problems.

Text Books:

1. E.Horowitz, S.Sahani, S.Rajasekaran, "Fundamentals of Computer Algorithms", 2nd Edition, University Press, 2007.

Suggested Readings:

1. R.Pannerselvam, "Design and Analysis of Algorithms", PHI, 2007.
2. Hari Mohan Pandey, "Design Analysis and Algorithms", University Science Press, 2009.

DATABASE MANAGEMENT SYSTEM

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To understand the fundamentals of data models and conceptualize and depict a database , System using ER diagram
2. To make a study of SQL and relational database design.
3. To know about data storage techniques and query processing.
4. To impart knowledge in transaction processing, concurrency control techniques and recovery procedures.

OUTCOMES:
1. Understand the basic concepts of the database and data models.
2. Design a database using ER diagrams and map ER into Relations and normalize the relations
3. Acquire the knowledge of query evaluation to monitor the performance of the DBMS.
4. Develop a simple database applications using normalization.
5. Acquire the knowledge about different special purpose databases and to critique how they differ from traditional database systems.

UNIT-I
Introduction to DBMS and DB Models: File system Vs. DBMS, Advantages of DBMS, Data Abstraction, Database Design, and ER diagrams, Entities, Attributes and Entity Sets, Relationship Sets, Additional features of ER model, Conceptual Design with the ER model. The Relational Model: Introduction to the Relational Model, Integrity Constraints over relations, Logical Database design(ER to Relational), creating tables, views, Destroying / Altering Tables and Views.
Schema Refinement and Normal Forms: Introduction to Schema Refinement, Functional Dependencies, Normal Forms, Decompositions, Normalizations.

UNIT-II
Relational Algebra and calculus: Preliminaries, Relational Algebra, Relational calculus, expressive, power of algebra and calculus
Structured Query Language: Overviews, Basic Structure of SQL, Queries, Set Operations, Null Values, Additional Basic Operations, Aggregate Functions, Nested Sub queries, Join Expression.
Advanced SQL: SQL Data Types, Integrity Constraints, Authorization, Functions and Procedural Constructs, Cursors, Triggers.

UNIT-III
Indexing and Hashing: Basic Concepts, File Organization Indexing, Index Data Structures, Tree-Structured indexing: Indexed sequential Access Method (ISAM) B+ Trees: A dynamic index structure, format of a node, search, Insert, Delete, Duplicates+ Trees in Practice.
Hash-Based Indexing: Static Hashing, Extendable Hashing, Linear Hashing, Extendable Hashing versus Linear Hashing. Comparison of Ordered Indexing and Hashing.

UNIT-IV
Transaction Management: ACID Properties, Transactions and Schedules, Concurrent Execution of Transactions, Lock-Based Concurrency Control.
Concurrency Control: 2PL, Serializability, and Recoverability, Introduction to Lock Management, Dealing with Deadlock, Specialized Locking Techniques, Concurrency Control without Locking.

UNIT-V
Crash Recovery: Introduction to ARIES, The Log, Other Recovery Related Structures, The WAL, Check pointing, Recovering from a system Crash, Media recovery.
Security and Authorization: Introduction to database security, Access Control Discretionary Access control, Mandatory access control. Additional Issues related to Security.

Text Book

1. Silberschataz, Korth, Sudarshan "Database System Concepts", 5th Edtn. McGraw Hill 2011.

Suggested Readings:

1. Raghu Ramakrishna, Johannes, Gehrke, "Database Management Systems", 3 [rd]Edition, Mc-Graw Hill 2003
2. RamezElmasri, Shamkant B. Navathe, Somayajulu, Gupta, "Fundamentals of Database systems", Pearson Education, 2006.

OPERATING SYSTEMS

Instruction	4 periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

OBJECTIVES:
1. To be aware of the evolution and fundamental principles of operating system, processes and their communication
2. To understand the various operating system components like process management, memory management
3. To know about file management and I/O subsystems concepts in operating systems
4. To be aware of components of operating system with relevant case study

OUTCOMES:
1. Able to understand the operating system components and its services
2. Able to demonstrate the mapping between the physical memory and virtual memory
3. Able to understand file handling concepts in OS perspective
4. Able to understand the operating system components and services.

UNIT -I
INTRODUCTION, SYSTEM STRUCTURES: Operating System Services, System Calls, Types of System Calls, System Programs, Operating System Design and Implementation, Operating System Structure, Virtual Machines, Operating System debugging.
PROCESS CONCEPT: Process Concept, Process Scheduling, Operations on process, Interprocess Communication.
MULTITHREADED PROGRAMMING: Multithreading Models, Thread Libraries, Threading Issues.
PROCESS SCHEDULING: Scheduling Criteria, Scheduling Algorithms, Thread Scheduling, Multiple Processor Scheduling.

UNIT- II
MEMORY MANAGEMENT STRATEGIES: Swapping, Contiguous Memory Allocation, Paging, Structure of the Page Table, Segmentation.
VIRTUAL MEMORY MANAGEMENT: Demand Paging, Copy on Write, Page Replacement Algorithms, Allocation of Frames, Thrashing.
FILE SYSTEM: File Concept, Access Methods, Directory and Disk Structure, File System Mounting, File Sharing, Protection.
IMPLEMENTING FILE SYSTEM: File System Structure, File System Implementation, Directory Implementation, Allocation Methods, Free Space Management, Efficiency and Performance, Recovery.

UNIT -III
PROCESS SYNCHRONIZATION: Critical Section Problem, Peterson's Solution, Semaphores, Classic Problems of Synchronization, Monitors.
DEADLOCKS: System Model, Deadlock Characterization, Methods in Handling Deadlocks, Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock.
SYSTEM PROTECTION: Goals of Protection, Principles of Protection, Domain of Protection, Access Matrix.

UNIT IV
SECONDARY STORAGE STRUCTURE: Overview of Mass Storage Structure, Disk Structure, Disk Attachment, Disk Scheduling, Disk Management, Swap Space Management, RAID Structure.
I/O SYSTEMS: I/O Hardware, Application I/O Interface, Kernel I/O Subsystem, Transforming I/O Request to Hardware Operations, STREAMS.

UNIT- V
CASE STUDIES:
THE LINUX SYSTEM: Linux History, Design Principles, Kernel Modules, Process Management, Scheduling, Memory Management, File Systems, Input and Output, Interprocess Communication.
SYMBIAN OS: History and Overview of Symbian OS, Process and Threads, Memory Management, Input and Output, Storage systems, Security.

Text Books:
1. Abraham Silberschatz, Peter B. Galvin, Greg Gagne, "Operating System Concepts", 8th Edition, John Wiley and Sons, 2011.
2. Andrew S. Tanenbaum, "Modem Operating Systems", 3rd Edition, Pearson Education 2009. (Unit V SYMBIAN OS)

Suggested Readings:
1. Gary Nutt, "Operating Systems", Third Edition, Pearson Education, 2004.
2. Harvey M. Deital, "Operating Systems", Third Edition, Pearson Education, 2004.

ORGANIZATIONAL BEHAVIOR

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
To familiarize the students with the theory and practices of organization behavior and to teach the students about organization theory dynamics.

UNIT – I
Organizational behavior – Nature and levels of organizational behavior – Individuals in organization – Individual differences – Personality and Ability – The Big 5 Model of personality – Organizationally relevant personality traits. The nature of perception – characteristics of the perceiver, target and situation – perceptual problems.

UNIT – II
Organizational Designs and Structures – Traditional and Contemporary organizational designs.Organizational culture and ethical behavior – factors shaping organizational culture– creating an ethical culture.

UNIT – III
Motivation–early and contemporary theories of motivation. Leadership – early and contemporary approaches to leadership.

UNIT – IV
Groups and group development – turning groups into effective teams.Managing change – process, types and challenges.Communicating effectively in organizations – communication process–barriers to communication–overcoming barriers to communication–persuasive communication–communication in crisis situations.

UNIT – V
Power, Politics, Conflict and Negotiations–Sources of individual, functional and divisional Power.Organizational politics.Conflict – causes and consequences – Pondy's model of organizational conflict–conflict resolution strategies.

Text Books:
1. Jennifer George and Gareth Jones "Understanding and Managing Organizational Behavior", Published by Pearson Education Inc.
2. Jon L Pierce and Donald G. Gardner, "Management and Organizational behavior", Cengage Learning India (P) Limited.
3. Richard Pettinger, "Organizational Behaviour", 2010 Routledge.

Suggested Reading:

1. Dipak Kumar Bhattacharya, "Organizational Behavior, Concepts and Applications", Oxford
2. K. Aswathappa, "Organizational behavior", Himalaya Publishing House.
3. John Schermerhorn, Jr., James G. Hunt and Richard N. Osborn, "Organizational Behaviour",10t edition, Wiley India Edition.
4. Stephen P. Robbins, Jennifer George and Gareth Jones, "Management and Organizational Behaviour", Pearson Education Inc.

TECHNICAL REPORT WRITING

Instruction   3 Periods per week
Duration of Main Examination   3 Hours
Main Examination   50 Marks
Sessional   25 Marks
Credits   2

OBJECTIVES:
Understands the LATEX documents.

1. Download and install a comprehensive LATEX distribution.
2. Create basic types of LATEX documents (article, report, letter, book).
3. Format words, lines, and paragraphs, design pages, create lists, tables, references, and figures in LATEX.
4. Typeset complicated mathematics: beginning with basic formulas (inline) and centered and numbered equations (display math) and aligning multi-line equations.
5. Typeset mathematics symbols such as roots, arrows, Greek letters, and a wide variety of mathematical operators.
6. Buildling complex math structures such as fractions, stacked expressions, and matrices.
7. Import graphics, as well as: building diagrams, enhancing figures, and plotting functions, using the graphics packages: pstricks, and PGF/tikz
8. Listing content and references: creating a table of contents and lists of figures and tables; as well as how to cite books, create bibliographies, and generate an index.
9. Introduction to IEEE and ACM Styles.

Text Book:

1. Leslie Lamport ," LaTeX: A document preparation system, User's guide and reference Manual".

DATABASE MANAGEMENT SYSTEMS LABORATORY

Instruction   3 Periods per week
Duration of Main Examination   3 Hours
Main Examination   50 Marks
Sessional   25 Marks
Credits   2

I.   SQL
1. Creating tables using commands in DDL
2. Manipulating the data using DML
3. Using Aggregate functions Set operators
4. Simple condition query creation using SQL Plus
5. Complex condition query creation using SQL Plus
6. Exercising all types of Joins, views
7. Exercising Data Control Language and Transaction Control Language

II.   PL/SQL
8. Demonstration of Blocks, Cursors,
9. Procedures, Functions and Packages.
10. Creation of Triggers

III. FORMS
11. Designing forms for various databases.(Creating, Inserting, Updating, Deleting)

IV.   REPORTS
12. Generation using SQLReports
13. Creation of Reports based on different queries .

Note:-The creation of sample database for the purpose of the experiments is expected to be pre-decided by the instructor.

Text Books:
1. Nilesh Shah, "Database Systems Using Oracle", PHI, 2007.
2. Rick F Van der Lans, "Introduction to SQL", Fourth Edition, Pearson Education, 2007.
3. Benjamin Rosenzweig, Elena Silvestrova, "Oracle PL/SQL byExample", Third Edition, Pearson Education, 2004.
4. Albert Lulushi, "Oracle Forms Developer's Handbook", PearsonEducation, 2006.

OPERATING SYSTEMS LABORATORY

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Internal Examination	25 Marks
Credits	2

OBJECTIVES:
1. To learn programs on system calls, threads and signals
2. To learn programs on process scheduling algorithms
3. To learn programs on Interprocess Communication.
4. To learn programs on synchronization problems
5. To learn programs on files
6. To learn about the basic Linux commands.
7. To learn basic shell programs.

OUTCOMES:
1. Able to write programs on system calls, threads and signals.
2. Able to learn programs on process scheduling algorithms
3. Able to write programs on Interprocess Communication.
4. Able to write programs on synchronization problems
5. Able write programs on files
6. Able to use basic Linux commands
7. Able to write basic shell programs

LIST OF PROGRAMES
1. Programs using process related systems calls.
2. Print type of file for each command line arguments.
3. Programs to create threads.
4. Program using Signals.
5. Programs on process scheduling algorithms
6. Echo server-using pipes.
7. Echo server-using message Queues.
8. Producer & Consumer Problem using Semaphores and Shared memory
9. Producer & Consumer Problem using message passing.
10. Readers & Writers Problem using Semaphores and Shared memory
11. Dining philosopher's problem using semaphores.
12. Programs related to files
13. Program using File Locking.
14. Basic Linux Commands
15. Basic shell scripts

Text Books:

1. W. Richard Stevens, "Unix Network Programming", Pearson Education Inc, PHI Learning 1990.
2. Behrouz A. Forouzan, Richard F. Gilberg, "UNIX and Shell Programming: A Textbook", Books/Cole-Thomson Learning, 2003.

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. II YEAR
MASTER OF COMPUTER APPLICATIONS

II SEMESTER

Sl. No	Syllabus Ref. No.	SUBJECT	Scheme of Instruction Periods per week L/T	D/P	Scheme of Examination Duration in Hours	Maximum Marks Semester End Exam	Sessionals	Credits
THEORY								
1	MC221	Data Warehousing and Data Mining	4	-	3	75	25	3
2	MC222	Computer Networks	4	-	3	75	25	3
3	MC223	Web Programming	4	-	3	75	25	3
4	MC224	Software Design and Architecture	4	-	3	75	25	3
5	**ELECTIVE**							
	MC251	Artificial Intelligence	4	-	3	75	25	3
	MC252	Distributed Systems	4	-	3	75	25	3
	MC253	Soft Computing	4	-	3	75	25	3
PRACTICALS								
6	MC226	Mini Project	-	3	3	50	25	2
7	MC227	Computer Networks Lab	-	3	3	50	25	2
8	MC228	Web Programming Lab	-	3	3	50	25	2
		TOTAL	**20**	**9**	**-**	**525**	**200**	**21**

L: Lecture, T: Tutorial, D: Drawing, P: Practical

DATA WAREHOUSING AND DATA MINING

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To expose the students to the concepts of Data warehousing Architecture and Implementation
2. To Understand Data mining principles and techniques and Introduce DM as a cutting edge business intelligence
3. To understand the mining concepts like association rule mining, classification and clustering.

OUTCOMES:
Upon Completion of the course, the students will be able to
1. Store voluminous data for online processing
2. Preprocess the data for mining applications
3. Apply the association rules for mining the data
4. Design and deploy appropriate classification techniques
5. Cluster the high dimensional data for better organization of the data

UNIT - I
Introduction: Motivation, Data Warehousing and Data Mining, History, Demand for strategic information, Users, Benefits and Concerns. Data Models and OLAP.
Data Warehousing: Features, Granularity, Information flow mechanism, Metadata, Classes of data, Lifecycle of data, Data flow from warehouse to operational systems.

UNIT – II
Architecture of a data warehouse: Introduction, Characteristics, Goals, Architecture, Data Warehouse and data mart, Issues, Building data marts. Data Warehouse Schema: Introduction, Dimension Modeling, Star Schema, Snowflake schema, Aggregate tables, Fact Constellation, Data Warehouse and Data Model.

UNIT - III
Dimensional Modeling: Other types of dimension tables, Keys to DW Schema, Enhancing performance, Technology requirements.
The ETL Process, Introduction, Data Extraction, Transformation, Loading, Quality.
OLAP in the Data warehouse: OLAP, Multidimensional analysis, Functions, Applications, Models, Design, Tools and Products, Data Design, Administration and Performance, OLAP platforms.

UNIT – IV

Frequent pattern Matching: Introduction, Problem Definition, Mining association rules, Applications, Variations, Interestingness, FIM algorithms, Current status, Optimal FIM algorithms, Incremental mining, Conciseness of results, Sequential rules.

UNIT - V
Classification: Introduction, Problem definition, Applications, Evaluation of clusters, Other issues, Classification techniques, Optimal Classification algorithms, Regression.

Clustering: Introduction, Problem definition, Applications, Measurement of similarity, evaluation, classification of clustering algorithms, partitioning methods, Hierarchical Methods, Density Based Methods, Grid Based methods, Outlier detection.

Text Books:
1. Jiawei Han, Micheline Kamber, "Data Mining - Concepts and Techniques", Morgan Kayufman, 2006.
2. Vikram Pudi P. Radha Krishna, "Data Mining", Oxford University Press, 1st Edition 2009.

Suggested Readings:
1. Arun K Pujari, "Data Mining Techniques", University Press, 2nd Edition, 2009.
2. Pang - Ning Tan, Michael Steinbach, Vipin Kumar, "Introduction to Data Mining, Pearson", Education, 2008.
3. MH Dunham, "Data Mining", Pearson Education, 2009.
4. S Anabory, D Murray, "Data Warehousing in the real World", Pearson Education, 2009.
5. ReemaTheraja, "Data Warehousing", Oxford University Press, 2009.

COMPUTER NETWORKS

Instruction   4L periods per week
Duration of Main Examination   3 Hours.
Main Examination   75 Marks
Internal Examination   20 Marks
Assignment   5Marks
Credits   3

OBJECTIVES:
1. To learn the basics of data communication and networks.
2. To get the idea of different layers of OSI model.
3. To learn the Socket programming concepts.

OUTCOMES:
1. Students would have gained good idea of the basics of data communication and networks.
2. Students will get the idea of different layers of OSI model.
3. Students will learn the Socket programming concepts.

UNIT - I
Data Communications: Components- Direction of Data Flow-Networks-Components and Categories-Types of connections-Topologies-Protocols and Standards-ISO/OSI model, TCP/IP.
Transmission Media-Coaxial cable-Fiber optics-Line coding-Modems-RS232 Interfacing.

UNIT-II
Data link Layer: Error detection and Correction, CRC, Hamming code, Flow control and Error control –Stop and Wait – Go back-N ARQ – Selective repeat ARQ _Sliding window Protocol-HDLC.

Mac Layer: LAN-Pure and Slotted ALOHA, Ethernet IEE 802.3-IEEE 802.4-IEEE 802.5,Bridges.

UNIT-III
Network Layer- Internetworks – Virtual circuit and Datagram Approach, Routers IP Addressing, Sub netting, CIDR.
Routing – Distance Vector Routing, Link State Routing, OSPF and BGP.

UNIT-IV
Transport Layer: Services of Transport Layer, Multiplexing.
Transmission Control Protocol (TCP) – Congestion control, Quality of Services(QOS) and User Datagram Protocol (UDP).
Application Layer: Domain Name Space (DNS) – SMTP – FTP –HTTP- WWW – Fire Walls.

UNIT-V
Socket Programming: Socket address, elementary socket system calls, advanced socket system calls, reserved ports, socket option, asynchronous I/O input/output Multiplexing out-of-band data, sockets and signals, Internet super server.

Text Books:
1. Behroz A Forouzan,"Data Communications and Networking", Tata McGraw – Hill,2009.(Unit-I to Unit-IV)
2. W. Richard Stevens, "UNIX NETWORK PROGRAMMING", Pearson Education Inc, PHI Learning 1990. (Unit V)

Suggested Readings:
1. Andrew S. Tanenbaum, "Computer Networks", 4thEdition, Pearson Education, 2003.

WEB PROGRAMMING

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To enable the student to understand web programming
2. To understand the latest web technologies like PHP, AJAX etc.

OUTCOMES:
1. Understand the basics of Web and XML
2. Identifies the difference between java script and vb script
3. Gets exposure the importance of server side programming
4. Gets the practice of database programming on web
5. Understands the latest web script language PHP.

UNIT – I
Markup Language (HTML): Introduction to HTML and HTML5 - Formatting and Fonts – Commenting Code – Anchors – Backgrounds – Images – Hyperlinks – Lists – Tables – Frames - HTML Forms.

Cascading Style Sheet (CSS): The need for CSS, Introduction to CSS – Basic syntax and structure -Inline Styles – Embedding Style Sheets - Linking External Style Sheets – Backgrounds – Manipulating text - Margins and Padding - Positioning using CSS.

UNIT – II
Object model and collections : Object referencing, Collections all, children frames, navigator object.Even Model :OnClick, OnLoad, OnMousemove, OnMouseover, OnMouseOut, OnFocus, OnBlur, OnSubmit. Error Handling: OnError.Working With Images: Filters and transitions, Active Controls.

UNIT- III
INTRODUCTION TO JAVASCRIPT
Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements -Functions - Objects - Array, Date and Math related Objects - Document Object Model - Event Handling- Controlling Windows & Frames and Documents - Form handling and validations.

UNIT – IV
INTRODUCTION TO VB SCRIPT
Introduction - Core features - Data types and Variables - Operators, Expressions, and Statements –Functions. String Manipulation, classes and objects.
Web servers : Installation requirements to load IIS and Apache Tomcat.

UNIT – V
PHP
Introduction - How web works - Setting up the environment (LAMP server) - Programming basics -Print/echo - Variables and constants – Strings and Arrays – Operators, Control structures and looping structures – Functions – Reading Data in Web Pages - Embedding PHP within HTML – Establishing connectivity with MySQL database.

Text Books:
1. Harvey & Paul Deitel & Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011**. (UNITS : 1 AND 2)**
2. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013**.(UNIT :3)**
3. "VBScript Programmers Reference" Wrox Press, 3rd edition**(UNIT : 4)**
4. Steven Holzner, "The Complete Reference - PHP", Tata McGraw Hill, 2008**(UNIT : 5)**

Suggested Reading :
1. http://php.net/manual
2. http:// www.w3schools.com
3. http:// www.devguru.com

SOFTWARE DESIGN AND ARCHITECTURE

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To enable the student to understand the principles and concepts of software design and architecture, design models, architectural models, user interface design.

OUTCOMES:
1. Student understands the fundamental principles of software design and architecture, the concepts of architectural styles, design models, principles of user interface design.
2. Student understands the principles of functional independence consisting of cohesion and coupling concepts.

UNIT-I
Design process and Design quality, Design concepts, -abstraction, architecture, modularity, information hiding, functional independence, Design model-data design elements, interface design elements.

UNIT-II
Golden rules of user interface design, interface analysis and design models, user analysis, task analysis and modeling, analysis of work environment, applying interface design steps, user interface design patterns.

UNIT-III
What is architecture, data design at architectural level, data design at component level, architectural styles, architectural patterns, representing system in context, refining architecture into components.

UNIT-IV
Architecture trade of analysis, architectural complexity, transform flow, transaction flow, transform mapping, transaction mapping,

UNIT-V
Designing class based components, guidelines, types of cohesion, types coupling, component level design, designing conventional components.

Text Books:
1. Roger S. Pressman, "Software Engineering, A Practitioner's Approach", McGraw hill International Edition, 6th edition, 2010.

ARTIFICIAL INTELLIGENCE
(ELECTIVE)

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To introduce the fundamental concepts of artificial intelligence.
2. To explore the different paradigms in knowledge representation and reasoning.
3. To understand the techniques in Statistical reasoning.
4. To understand the different techniques like game playing and planning.

OUTCOMES:
1. Student able to understand the history, development and various applications of artificial intelligence;
2. Familiarize with propositional and predicate logic and their roles in logic programming.
3. Students learn the knowledge representation and reasoning techniques in rule-based systems, case-based systems, and model-based systems;
4. Student can understand how uncertainty is being tackled in the knowledge representation and reasoning process, in particular, techniques based on probability theory and possibility theory (fuzzy logic).

UNIT – I
AI: Definition, The AI Problems, The Underlying Assumption, AI Technique, The Level of the Model, Criteria for Success.
Problems, Problem Spaces, and Search: Defining the Problem as a State Space Search, Production Systems, Problem Characteristics, Production System Characteristics.

UNIT – II
Heuristic Search Techniques: Generate and Test, Hill Climbing, Best First Search, Problem Reduction, Constraint Satisfaction.
KR using Predicate Logic: Representing Simple Facts in Logic, Representing Instance and ISA Relationships, Computable Functions and Predicates, Resolution, Natural Deduction.

UNIT-III
Representing Knowledge Using Rules: Procedural versus Declarative Knowledge, Logic Programming, Forward versus Backward Reasoning, Matching, Control Knowledge.
Symbolic Reasoning Under Uncertainty: introduction to Nonmonotonic Reasoning, Logics for Nonmonotonic Reasoning Implementation Issues, Augmenting a Problem-Solver, Implementation: Depth First Search, Implementation: Breath First search.

UNIT-IV
Statistical Reasoning: Probability and Bayes Theorem, Certainty Factors and Rule-based Systems, Bayesian Network, Dempster-Shafer Theory, Fuzzy logic.
Weak Slot-and-Filler Structures: Semantic Nets, Frames.
Strong Slot-and-Filler Structures: Conceptual Dependency, Scripts.

UNIT-V
Game Playing: The Minimax Search Procedure, Adding Alpha-beta Cutoffs, Additional Refinements, Iterative Deepening.
Planning: The Blocks World, Components of a Planning Systems, Goal Stack Planning, Nonlinear Planning Using Constraint Posting, Hierarchical Planning, Reactive Systems.

Text Books:
1. Elaine Rich, Kevin Knight, Shivashankar B Nair, "Artificial Intelligence", Third Edition, TMH, 2009
2. NP Padhy, "Artificial Intelligence and Intelligent Systems", Oxford, 2009
3. S. Russell, P Norving, "Artificial Intelligence", Second Edition, Pearson Education, 2009

DISTRIBUTED SYSTEMS
(ELECTIVE)

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5Marks
Credits	3

OBJECTIVES:
1. To enable the student to understand the basic architecture of distributed systems.
2. To provide the concepts of distributed systems topology, message communications, fault tolerance mechanism and file systems.

OUTCOMES:
1. Student understands the architecture, role of middle ware, communication systems, applications and file systems of distributed systems.
2. Student understands the principles of distributed object systems architecture and distributed shared memory.

UNIT-I
Introduction to Distributed Systems: Definition, Goals, Hardware and software Concepts and client/server model.
Processes: Threads, Clients, Servers, Code Migration, Software agents.

UNIT-II
Naming; Entities: DNS, X.500, Locating Mobile entities, clock, logical clock, Global state, election algorithms. Mutual exclusion, distributed Transaction.

UNIT-III
Fault Tolerance: Introduction, Process resilience, Reliable client-server and Group communication. Distributed Commit and Recovery.

UNIT-IV
Distributed Object based Systems: CORBA, D-COM & GLOBE. Distributed File System, Case studies: SUN NFS, CODA.

UNIT-V
Distributed shared memory: Implementation algorithms, memory coherence, And Design issues. Issues in Load Distributing, Components of Load Distributing Algorithms, Load Distributing   Algorithms.

Suggested Readings :
1. Andrew S. Tanenbaum and Van Steen, "Distributed Systems", Pearson Education, 2002.
2. Singhal M, Shivaratri N.G, "Advanced concepts in operating systems". Mc-Graw-HiUIntl., 1994.

SOFT COMPUTING
(ELECTIVE)

Instruction	4L periods per week
Duration of Main Examination	3 Hours
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	2

OBJECTIVES:
After Completion of this course, the student should be able to get an ideal on:
1. Various types of soft computing techniques and their applications.
2. Various types of neural network architectures, learning methods and algorithms.
3. Fuzzy logic and their applications.
4. Genetic algorithms and their applications.

OUTCOMES:
After the end of the course the student should be able to:
1. Learn about soft computing techniques and their applications.
2. Apply Neural Network techniques to various types of problems.
3. Understand fuzzy logic, genetic algorithms and their applications.

UNIT-I
Soft computing vs. Hard computing, Various types of soft computing techniques, Applications of soft computing.
Artificial Neural Networks: Fundamental concepts, Evolution of neural networks, Basic models of artificial neural network, Important terminologies of ANNs. McCulloch-Pitts neuron, Linear separability, Hebb network.

UNIT-II
Supervised Learning Neural Networks: Perceptron networks, Adaptive linear neuron(Adaline), Multiple Adaptive linear neuron(Madaline), Back propagation network, Radial basis function network.

UNIT-III
Unsupervised Learning Neural Networks: Kohonen self organizing networks, Adaptive resonance theory.
Associate Memory Networks: Bidirectional associative memory network, Hopfield networks.

UNIT-IV
Fuzzy Logic: Introduction to classical sets and Fuzzy sets, Fuzzy relations, Tolerance and equivalence relations, Membership functions, Defuzzification, Fuzzy arithmetic and Fuzzy measures.

UNIT-V
Genetic Algorithms: Introduction, Basic operators and terminology, Traditional algorithm vs. genetic algorithm, Simple genetic algorithm, General genetic algorithm, Classification of genetic algorithm, Genetic programming, Applications of genetic algorithm.

Text Books:

1. S.N. Sivanandam& S.N. Deepa, ”Principles of soft computing”, Wiley publications, 2nd Edition, 2008.

Suggested Readings:
1. S. Rajasekaran& G.A. Vijayalakshmipai, "Neural Networks, Fuzzy logic & Genetic Algorithms, Synthesis & Applications", PHI publication, 2008.
2. K.L.Du& M.N.S Swamy, "Neural Networks in a Soft Computing Framework", Springer International edition, 2008.
3. Simon Haykins, "Neural Networks a Comprehensive Foundation", PHI, second edition.
4. B. Yegnanarayana, "Artificial Neural Networks", PHI, 2001.
5. Goldberg, David E., "Genetic Algorithms in Search, Optimization and Machine Learning", Addison Wesley, New Delhi, 2002.
6. Timothy J.Ross, "Fuzzy logic with Engineering Application", Wiley India, second edition 2007.

MC226   **With effect from Academic Year 2014-15**
                             MINI PROJECT

Instruction   3 Periods per week
Duration of Main Examination   3 Hours
Main Examination   50 Marks
Internal Examination   25 Marks
Credits   2

OBJECTIVES:
The students get a basic idea and exposure, to understand the concept of a software project structure and the construction of the same.

OUTCOMES:
After completion, the students will be able to understand the basics of software project analysis design and coding concepts.

The students will carry out a literature survey of any information system, and develop the requirement analysis, design & produce code. Along with the output of the project a SRS document will be prepared. The recommended domains are :- data structures, web programming, DBMS, computer networks & operating systems.

Students are required to submit a report on the mini project at the end of the semester.

COMPUTER NETWORKS LABORATORY

Instruction   3 Periods per week
Duration of Main Examination   3 Hours
Main Examination   50 Marks
Internal Examination   25 Marks
Credits   2

List of Programs

1. Using and understanding following Commands. Ifconfig, net stat, ping, arp, telnet, fttp ftp, finger.
2. a) Connection oriented Iterative Echo Server
   b) Connectionless Iterative Echo server
3. a) Connection oriented Concurrent Echo Server
   b) Connectionless Concurrent Echo server
4. a) Connection oriented Iterative Time Server
   b) Connectionless Iterative Time Server
5. a) Connection oriented Concurrent Time Server
   b) Connectionless Concurrent Time Server
6. Ping service implementation.
7. Remote program execution.
8. Program to pass file descriptors.
9. Implementation of Remote Program execution using Socket system calls.
10. To demonstrate the usage of Advanced Socket System Calls like Getsockopt ( ), Setsockopt( ), Select (), Readv ( ), getpeernamet ( ), Getsockname().
11. To demonstrate the Non-Blocking (Asynchronous) Input-Output.
12. To demonstrate the implementation of Pre forked Server .

Text Books

1. W. Richard Stevens, "Unix Network Programming", Pearson Education Inc, PHI Learning 1990.

WEB PROGRAMMING LABORATORY

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Internal Examination	25 Marks
Credits	2

LIST OF EXPERIMENTS
1. Creation of HTML Files
2. Working with CSS
3. Working with Client Side Scripting
    3.1 VBScript
    3.2 JavaScript
4. Configuration of web servers
    4.1 Apache Web Server
    4.2 Internet Information Server (IIS)
5. Working with ActiveX Controls in web documents.
6. Working with other Server Side Scripting
    6.1 Active Server Pages
    6.2 JSP
    6.3 PHP
7. Sample Experiments in Ajax Programming
8. Working with JDBC connection.
9. Developing any E-commerce application

Text Books :
1. Harvey & Paul Deitel& Associates, Harvey Deitel and Abbey Deitel, "Internet and World Wide Web - How To Program", Fifth Edition, Pearson Education, 2011. (UNITS : 1 AND 2)
2. Thomas A Powell, Fritz Schneider, "JavaScript: The Complete Reference", Third Edition, Tata McGraw Hill, 2013.(UNIT :3)
3. "VBScript Programmers Reference", Wrox Press, 3rd edition(UNIT : 4)
4. Steven Holzner, "The Complete Reference - PHP", Tata McGraw Hill, 2008 (UNIT : 5)

Suggested Readings :
1. http://php.net/manual/
2. http:// www.w3schools.com
3. http:// www.devguru.com

Syllabus of M.C.A. III YEAR

OF

THREE YEAR PG COURSE

IN

MASTER OF COMPUTER APPLICATIONS

DEPARTMENT OF MASTER OF COMPUTER APPLICATIONS
CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY (Autonomous)
Hyderabad – 500 75

CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY, GANDIPET, HYDERABAD – 075
(Accredited four times by NBA – AICTE, an UGC Autonomous Institute)
Department of Master of Computer Applications

MINUTES OF 4th BOARD OF STUDIES MEETING HELD ON 02-04-2015

Members present:

1. Dr. C.R. Rao, Professor, DCIS, University of Hyderabad.
2. Dr. V. Kamashi Prasad, Professor, JNTUH, Hyderabad.
3. Mr. Sri Ram, Isilica, Hyderabad.
4. Dr. Y. Rama Devi, Head, Dept. of MCA, CBIT.
5. Mr. M. Kalidas, Assoc. Prof., Dept. of MCA, CBIT.
6. Mr. D. Jayaram, Assoc. Prof., Dept. of MCA, CBIT.
7. Mr. GNR Prasad, Assoc. Prof., Dept. of MCA, CBIT.
8. Mr. M. Ramchandar, Asst. Prof., Dept. of MCA, CBIT.
9. Mr. P. Krishna Prasad, Asst. Prof., Dept. of MCA, CBIT.

The following recommendations were made by the members of BOS present during this meeting.

1. Committee members suggested to add Pre Requisites for every subject.

2. It was recommended to maintain a common standard while writing the titles of the books, Author names, Editions, Publisher name, year of publication.

3. Latest books to be added for reading in the subject of MiddleWare Technologies.

4. Expert lectures from Industry personnel to be conducted to motivate and impart latest state of art of Technology to the students.

5. The procedure of Mapping Project work hours to the appropriate number of credits has to be specified.

The Chairman, Board of Studies has thanked all the member for their valuable suggestions and concluded with Vote of Thanks.

Chairman 2/4/15
BOS, MCA

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. III YEAR
MASTER OF COMPUTER APPLICATIONS

I SEMESTER

S No.	Syllabus Ref. No.	Subject	Scheme of Instruction Periods per week		Scheme of Examination	Maximum Marks		
			L/T	D/P	Duration in hrs	Semester End Exam	Sessionals	Credits
		THEORY						
1.	MC 311	Information Security	4	-	3	75	25	3
2.	MC 312	Middleware Technologies	4	-	3	75	25	3
3.	MC 313	Object Oriented System Development	4	-	3	75	25	3
		Elective – II (Any One)						
4.	MC 361	Software Testing	4	-	3	75	25	3
	MC 362	Mobile Computing	4	-	3	75	25	3
	MC 363	Multimedia	4	-	3	75	25	3
		Elective–III (Any One)						
5.	MC 371	Software Project Management	4	-	3	75	25	3
	MC 372	Cloud Computing	4	-	3	75	25	3
	MC 373	Information Retrieval Systems	4	-	3	75	25	3
		PRACTICALS						
6.	MC 316	Programming Lab-OOSD	-	3	3	50	25	2
7.	MC 317	Programming Lab- MWT	-	3	3	50	25	2
8	MC 318	Seminar	-	3	3	50	25	2
	TOTAL		**20**	**9**	**-**	**525**	**200**	**21**

L: Lecture, T: Tutorial, D: Drawing, P: Practical

SCHEME OF INSTRUCTION AND EXAMINATION
M.CA. III YEAR
MASTER OF COMPUTER APPLICATIONS

II SEMESTER

Sl No.	Syllabus Ref. No.	Subject	Scheme of Instruction		Scheme of Examination			
			Periods per week		Duration in hrs	Maximum Marks		
			L/T	D/P		Semester End Exam	Sessionals	Credits
1.	MC 901	Project Work	-	6	3	Grade	50	16
2.	MC 322	Seminar	-	3	3	--	25	2
	TOTAL		-	9	-	---	75	18

L: Lecture, T: Tutorial, D: Drawing, P: Practical

❖ Projects are evaluated with Viva Voce examination and the following grades are awarded:

Excellent/Very Good/Good/Satisfactory/ Not Satisfactory

In case of Not Satisfactory, the candidates have to read the project and submit   at   the   time   of   next semester examination.

INFORMATION SECURITY

Instruction	4L periods per week
Duration of Main Examination	3 Hours
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To gain the knowledge of SDLC and the need for Security.
2. To gain the knowledge of Legal, Ethical professional issues.
3. To gain the knowledge of Firewalls and VPNS & Cryptographic Algorithms.

Course Outcomes:

1. Students would have gained knowledge of SDLC and requirement of Information Security.
2. Students would have gained knowledge of Legal, Ethical Professional Issues.
3. Students would have gained knowledge of Firewalls and VPNS, knowledge of Cryptographic Algorithms.

Pre Requisites:

1. Students should have knowledge of Computer Networks and Data Communications.

Unit-I
Introduction: History, Critical characteristics of information, Components of an information system, securing the components, The SDLC, The security SDLC. Security Professionals and the organization. Need for Security: Business needs, Threats, Attacks- secure software development.

Unit-II
Legal, Ethical and Professional Issues: Law and ethics in information security, Ethics and information Security.
Security Analysis: Risk Management, Identifying and assessing risk, Controlling Risk.
Planning for Security: Security policy, Standards and practices, Design of Security Architecture.

Unit-III
Security Technology: Firewalls and VPNs: Physical design Firewalls, Protecting remote connections.
Intrusion detection and other security tools: Intrusion detection and prevention systems, Scanning and analysis tools.

Unit-IV
Cryptography: Foundations of cryptology, Cipher methods, Cryptographic Algorithms (Symmetric Key-DES,IDEA, and AES) and public key cryptography (Public key Encryptions-RSA), Cryptographic tools, Protocols for secure communications, Attacks on cryptosystems.

Unit- V
Message Digest: Message Digest (MD-5, SHA), Digital signatures.
SSL and SET: SSL and SET protocols, Internet transactions using both SSL and SET.

Text Books:

1. Michel E Withman and Herbert J Mattord, "Principles and Practices of Information Security", Cengage Learning, 2009 (Unit-I to III).

2. William Stallings, "Cryptography and Network Security", Pearson Education, 2000.
<div align="right">(Unit-III, IV and V)</div>

Suggested Reading:

1. Thomas R Peltier, Justin Peltier, John Blackley, "Information Security Fundamentals", Auerbach Publications, 2010

2. Behrouz A. Forouzan, "Cryptography and Network Security", Tata McGraw Hill, 2007.

MIDDLEWARE TECHNOLOGIES

Instruction   4L periods per week
Duration of Main Examination   3 Hours.
Main Examination   75 Marks
Internal Examination   20 Marks
Assignment   5 Marks
Credits   3

Course Objectives:

1. To understand the fundamentals of Web Services.
2. To make a study of basics EJB types of EJB and applications.
3. To impart knowledge in CORBA and COM.
4. To learn a latest framework .NET.

Course Outcomes:

1. Understand the basic concepts of the various Web services
2. Acquire the knowledge of EJB and its types.
3. Understanding the differences between CORBA and COM
4. Acquire the knowledge about different .NET framework and its programming

Pre Requisites:

1. A knowledge on Distributed Systems is required.
2. A knowledge on Java Programming language is required.
3. A knowledge on Java Script and VB Script is required.
4. A knowledge on Web programming is required.

Unit – I
Client/Server Concepts: Client/Server, File Server, Database server, Group server, Object Server, Web server, Middleware – General middleware –Service specific middleware. Client/Server Building blocks – RPC – Messaging – Peer- to- Peer. Web Services – SOA, SOAP, WSDL, REST Services.

Unit – II
EJB Architecture: EJB – EJB Architecture – Overview of EJB software architecture –View of EJB – Conversion – Building and Deploying EJBs – Role in EJB.

Unit – III
EJB Applications: EJB Session Beans – EJB entity beans – EJB Clients – EJB Deployment Building an application with EJB.

Unit – IV

Introduction to .NET, Overview of .NET applications, .NET Framework – CTS – CLS – CLR – Managed execution, Runtime environment. Understanding assemblers, .NET security.

Introduction Microsoft Visual C# and Visual Studio.NET : Welcome to C# , Working with variables, operators, and expressions; writing methods and applying scope, using decision statements, using iteration statements, managing errors and exceptions.

Unit -V

Understanding the C# Language : Creating and managing classes and objects, understanding values and references, creating value types with enumerations and structures, using arrays and collections, understanding parameter arrays, working with inheritance, using garbage collection and resource management.

Working with Windows Applications: Introducing windows forms, working with menus, performing validation, using complex controls, using the MDI, Windows and dialog boxes, creating GUI Components.

Text Books:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client / Server Survival Guide", Galgotia Publications Pvt.Ltd, 2002 (Unit 1).

2. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002 (Unit 2 & 3).

3. John Sharp, Job Jagger, "Microsoft Visual C#.NET step by step", Prentice hall of India Private Ltd, 2003. (Unit 4 & 5)

Essential Reading

1. Jeffrey R. Shapiro, "The Complete Reference Visual Basic.NET", TMH, 2002.

2. Burton Harvey, Simon Robinson, Julian Templemanm, Karli Watson, " C# Programming ", 3rd Indian Reprint, Shroff Publishers & Distributors Pvt. Ltd, 2001.

OBJECT ORIENTED SYSTEM DEVELOPMENT

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To understand the basic building blocks of UML.
2. To learn about the structural and Dynamic modeling.
3. Understanding the concepts of Architectural modeling.
4. To understand the concept and structure of USDP.

Course Outcomes:

1. Students would have gained the knowledge of how to model the object oriented applications through UML.
2. Students would have gained the knowledge of Structural and Behavioral modeling
3. Student would have gained the theoretical knowledge of Forward and Reverse Engineering.

Pre Requisites:

1. Students should have the knowledge of Software Engineering Principles and the stages of Software Development Life Cycle and the Traditional models.

Unit – I
UML Introduction: Why we model, introducing the UML, Building blocks of UML.
Basic Behavioral Modeling: Use Cases, Use Case Diagrams,
Structural Modeling: Classes, Class Diagrams, Relationships, Common Mechanism, Advanced Structural Modeling, Object Diagrams

Unit – II
Dynamic modeling: Interactions, Interaction Diagrams, Events and signals, State Machines, Processes and Threads, Time and Space, State Chart Diagrams, Activity Diagrams.

Unit – III
Architectural Modeling: Interfaces, Packages, Instances, Components, Component Diagrams, Design Patterns and Frame works, Deployment diagrams, Systems and models,

Unit – IV
Unified Software Development Process: The Unified Process, The Four Ps, Use-Case- Driven Process, Architecture – Centric Process, Iterative and Incremental Process.

Unit – V
Core Workflows: Requirements Capture, Capturing Requirements as Use Cases, Analysis Model, Design Model, Implementation Model and Test Model.

Text Books:

1. Grady Booch, James Rumbaugh, Ivor Jacbson, "The Unified Modeling Language – User Guide", 2nd Edition, Pearson Education, India, 2007.

2. Ivor Jacbson, Grady Booch, James Rumbaugh, "The Unified Software Development Process", Pearson Education, India, 2008.

Suggested Reading:

1. Grady Booch, Rabert A. Maksimehuc and Three more, " Object Oriented Analysis and Design with Applications", 3rd Edition, Pearson Education, 1991.

2. Craig Larman, "Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development", 3rd Edition, Pearson Education, 2008.

3. Ali Bahrami, "Object Oriented System Development", Irwin/Mc Graw Hill, 1999.

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SOFTWARE TESTING

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Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To understand the basic concepts of Testing.
2. To learn about the Functional and Integration Testing.
3. Understanding the concepts Object Oriented and Millennium Testing.

Course Outcomes:

1. Students would have gained the knowledge of Functional and Integration Testing.
2. Students would have gained the knowledge of Object Oriented Testing, Millennium Testing.
3. Students should have gained the knowledge testing tools which are to be applied for various applications.

Pre Requisites:

1. Students should have the knowledge of Software Engineering Principles and the basic knowledge of Testing Approaches and Strategies.

Unit-I
Introduction to Software Testing Concepts, White Box Approach, Basis Path Testing, Cyclomatic Complexity, Independent paths, D-D Graphs, Dataflow Testing,

Unit-II
Functional Testing: Boundary Value Testing, Equivalence Class Testing, Decision Table-Based Testing, Retrospective on Functional Testing.

Unit-III
Integration and System Testing: Levels of Testing, Unit testing, Integration Testing, System Testing, Interaction Testing.

Unit-IV
Object-Oriented Testing: Issues in Object-Oriented Testing, Class Testing, GUI Testing, Object-Oriented System Testing.

Unit-V
Millennium Testing: Exploratory Testing, Model-Based Testing, Test-Driven Development, All Pairs Testing, Software Testing Excellence.

Text Books:

1. Paul C. Jorgensen, "Software Testing: A Craftsman's Approach", 3rd Edition, CRC Press, 2007.

2. Roger S. Pressman "Software Engineering", 7th Edition, Pearson Education.

Suggested Reading:

1. Boris Beizer, "Software Testing Techniques", 2nd Edition, Dreamtech, 2013.

2. M.G. Limaye, "Software Testing: Principles – Techniques and Tools", 1st Edition, Tata Mc. Hill, 2009

3. Mauro Pezze, Michal Young, "Software Testing and Analysis: Process, Principles and Techniques", Wiley India Pvt. Ltd.

MOBILE COMPUTING

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To understand the basic concepts of Data Communications.
2. To learn about the telecommunications and broadcasting systems.
3. Understanding the concepts of Wireless LANs.
4. Learn the features of different mobile OS and Mobile Applications.

Course Outcomes:

1. Good Knowledge on Data Communications.
2. Understanding the Implementation of telecommunications and broadcasting systems.
3. Awareness of Wireless Transmissions and Protocols.
4. Capable to develop mobile applications.

Pre Requisites:

1. Students should have knowledge of Computer Networks and Data Communications.

Unit- I
Introduction and applications of mobile computing, Wireless transmission: Frequencies, Signals, Antennas, Signal Propagation, Multiplexing, Modulation, Spread spectrum, Cellular systems. Medium Access Control, SDMA, FDMA, TDMA, CDMA, Comparisons.

Unit- II
Telecommunication system: GSM, DECT, TDMA, TETRA, UMTS & IMT-2000.
Satellite systems: Applications, Basics, routing, localization, Handover.
Broadcast systems: Cyclic representation of data, Digital audio Broad casting, Digital video Broadcasting, Convergence of Broadcasting and mobile communication.

Unit- III
Wireless LAN: Infrared Vs Radio Transmission, Infrastructure and Ad hoc Networks, IEEE 802.11, HIPERLAN, Bluetooth.

Unit- IV
Mobile IP, Dynamic Host Configuration Protocol, Mobile Adhoc Networks, Mobile Transport Layer, Traditional TCP, Classical TCP improvements, TCP over 2.5/3G Wireless Networks, Performance Enhancing Proxies.

Unit- V

File systems, WWW, Wireless Application Protocol.
Introduction to Android and IOS, Mobile Applications: PhoneGap, Monotouch, Mono and Derby

Text Books:

1. Jochen M.Schiller, "Mobile Communications", 2nd Edition, Pearson Education, India 2003. (Unit I – V)(Unit-V: Chapter 10: File systems, WWW, WAP).

2. Jeff McWheter, Scott Gowell, "Professional Mobile Application Development", Wiley India Pvt. Ltd. – 2013 (Unit – V: Chapter 6, 7, 11 and 12).

Suggested Reading:

1. Dharma P. Agarwal, Qing An Zeng, "Introduction to wireless and Mobile systems", 2nd Edition, Thomas India, 2007.

2. Frank Adelstien, Sandeep K.S.Gupta, "Fundamentals of Mobile and Pervasive Computing", Tata McGraw Hill, 2005.

3. Ivan Stojmenovic, "Handbook of Wireless and Mobile Computing", Wiley India, 2006

MULTIMEDIA

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To impart the knowledge of Multimedia concepts.
2. To elaborate the elements and techniques of Multimedia to the students.
3. To make the students verse with the global applications of Multimedia in various domains.

Course outcomes:

1. Students would have learned the knowledge of the concepts of Multimedia
2. Students would have learned the knowledge of different Multimedia tools.
3. Students would have learned the application of Multimedia Techniques, which are to be applied in various domains of computer applications.

Pre Requisites:

1. A basic knowledge of File Systems, Digital Electronics is required.

Unit – I
Multimedia and Digital Representation: Characteristics of Multimedia Presentation, Multiple Media, Hardware and Software Requirements, Steps for Creating a Multimedia Presentation, Digital Representation, Relation between Sampling and Bit Depth.

Unit – II
Visual Display Systems – Text – Image: Video Adapter Card, Liquid Crystal Display (LCD), Plasma Display Panel (PDP), Text Compression, File Formats, Image Types, Basic Steps for Image Processing, Image Processing Software.

Unit – III
Graphs and Audio : Advantages of Graphs, Uses of Graphs, Components of Graphics Systems, Clipping Algorithms, 3D Graphics, Audio Mixer, Musical Instrument Digital Interface (MIDI), Audio File Formats.

Unit – IV
Video and Compression : Types of Animation, Computer Assisted Animation, 3D Animation, Special Effects, Lossy / Perceptual Compression Techniques, JPEG Image Coding Standard, MPEG Image Coding Standard, MPEG-2 Video, MPEG-4, MPEG-7.

Unit – V

Multimedia Architecture and Application Development : Multimedia Architecture, Hardware Support, Real time Protocols, Streaming Techniques, Multimedia Database Systems (MMDBS), Software Life Cycle Overview, Virtual Reality, Virtual Reality Modeling Language (VRML).

Text Books:

1. Ranjan Parekh, "Principles of Multimedia", 12th Edition, Tata Mc Graw Hill, 2012

Suggested Reading:

1. James E. Shuman, "Multimedia in Action", Cengage India Pvt. Ltd., 1998.

2. John F Koegel Boford, "Multimedia Systems", 3rd Edition, Pearson Education.

SOFTWARE PROJECT MANAGEMENT

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. To introduce software project management and to describe its distinctive characteristics.
2. To discuss project planning and the planning process.
3. To show how graphical schedule representations are used by project management.
4. To discuss the notion of risks and the risk management process.

Course outcomes:

1. A basic knowledge of software project management principles
2. The ability to come up with a project schedule and assign resources
3. Choose an appropriate project development methodology (e.g. Waterfall, Spiral..) and identify project risks, monitor and track project deadlines.
4. The capability to work in a team environment and be aware of different modes of communications

Pre Requisites:

1. Students should have concepts of Software Engineering.

Unit I
Introduction to Software Project Management, Project Evaluation and Programme Management, An Overview of Project Planning.

Unit II
Selection of an Appropriate Project Approach, Software Effort Estimation, Activity Planning.

Unit III
Risk Management, Resource Allocation, Monitoring & Control.

Unit-IV
Managing Contracts, Managing People in Software Environments, Working in Teams.

Unit –V
Software Quality, ISO, An Overview of PRINCE 2.

Text Books:

1. Bob Hughes and Mike Cotterell, "Software Project Management", 5th Edition, Tata McGraw Hill, 2010.

Suggested Reading:

1. Walker Rayce, "Software Project Management: A Unified Framework", Addison Wesley, 1998.

2. Watts S. Humphrey, "Managing Software Process", Addison – Wesley Pearson Education, 1998.

CLOUD COMPUTING

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:
1. To understand the fundamentals of Cloud Computing
2. To make a study of basics Virtual Machines and virtualization
3. To understand the architecture of cloud computing and impart knowledge in Cloud Security
4. To learn a Cloud Programming and Software Environments

Course Outcomes:

1. Understand the basic concepts of the cloud computing.
2. Understand the virtual machines and virtualization.
3. Understanding the Cloud computing through Case studies.
4. Gaining the importance of security in Cloud.
5. Learning Cloud supporting languages.

Pre Requisites:

1. This course assumes a sound background in operating systems and computer architecture. All students should be proficient in a programming language such as C# or Java or python as used on an operating system like Windows or Linux.

UNIT - I
The Evolution of Cloud Computing: Hardware Evolution, Internet Software Evolution, Server Virtualization. Web Services Delivered from the Cloud : Communication-as-a-Service (CaaS),Infrastructure-as-a-Service (IaaS), Monitoring-as-a-Service (MaaS),Platform-as-a-Service (PaaS),Software-as-a-Service (SaaS).

UNIT - II
Building Cloud Networks : The Evolution from the MSP Model to Cloud Computing and Software-as-a-Service, The Cloud Data Center, Collaboration, Service-Oriented Architectures as a Step Toward Cloud Computing, Basic Approach to a Data Center-Based SOA,The Role of Open Source Software in Data Centers, Where Open Source Software Is Used.

UNIT - III

Virtualization Practicum, Federation, Presence, Identity, and Privacy inthe Cloud : Federation in the Cloud, Presence in the Cloud,Privacy and Its Relation to Cloud-Based Information Systems.

UNIT - IV

Security in the Cloud: Cloud Security Challenges, Software-as-a-Service Security,Is Security-as-a-Service the New MSSP.

UNIT - V

Common Standards in Cloud Computing : The Open Cloud Consortium, The Distributed Management Task Force, Standards for Application Developers, Standards for Messaging, Standards for Security. End-User Access to Cloud Computing : YouTube API Overview ,Zimbr, Facebook,Zoho, DimDim Collaboration

Text Book:

1. John W. Rittinghouse, James F. Ransome, "Cloud Computing: Implementation, Management and Security", CRC Press 2009.

Suggested Reading:

1. Kai Hwang. Geoffrey C.Fox, Jack J. Dongarra, "Distributed and Cloud Computing From Parallel Processing to the Internet of Things", Elsevier, 2012.

2. Rajkumar Buyya, James Broberg and Andrzej M. Goscinski, "Cloud Computing: Principles and Paradigms (Wiley Series on Parallel and Distributed Computing)", Wiley Publishing, 2011

3. Raluca Ada Popa, Catherine M.S. Redfield, Nickolai Zeldovich, and Hari Balakrishnan, "CryptDB: Protecting Confidentiality with encrypted Query Processing" 23rd ACM Symposium on Operating Systems Principles (SOSP 2011), Cascais, Portugal October 2011.

INFORMATION RETRIEVAL SYSTEMS

Instruction	4L periods per week
Duration of Main Examination	3 Hours.
Main Examination	75 Marks
Internal Examination	20 Marks
Assignment	5 Marks
Credits	3

Course Objectives:

1. This course shall be useful to gain knowledge on Information Storage and Processing.
2. The course will establish the knowledge of Retrieval and Performance of Information Retrieval Systems.

Course Outcomes:

1. To know the capabilities of IR Systems.
2. To understand the Design and Implementation of IR Systems.
3. To evaluate the performance of an IR Systems.
4. To extract relevant information from large collections.

Pre Requisites:

1. Knowledge required on File Systems, DBMS and Data Structures.

UNIT-I
Introduction to Information Retrieval Systems: Definition, Objectives, Functional Overview, Relationship to DBMS, Digital libraries and Data warehouses.

Information Retrieval System Capabilities: Search capabilities, Browse capabilities, miscellaneous capabilities.

UNIT-II
Cataloging and Indexing: Objectives of Indexing, Indexing Process, Automatic Indexing, Information Extraction.
Data Structures: Introduction to Data Structures, Stemming Algorithms, Inverted File Structure, N-gram Data Structures, PAT data Structure, Signature File Structure, Hypertext Data Structure.

UNIT-III
Automatic Indexing: Classes of Automatic Indexing, Statistical Indexing, Natural Language, Concept Indexing, Hypertext Linkages.
Document and Term Clustering: Introduction to Clustering, Thesaurus generation, Item Clustering, Hierarchy of Clusters.

User Search Techniques: Search statements and binding, Similarity measures and ranking, Relevance feedback. Selective dissemination of information search, weighted searches of Boolean systems, Searching the Internet and hypertext.

UNIT-IV
Information Visualization: Introduction to Information Visualization, Cognition and Perception, Information Visualization Technologies.
Text Search Algorithms: Introduction to Test Search Algorithms, Software Text Search Algorithms, Hardware Text Search Systems.

UNIT –V
Multimedia Information Retrieval: Spoken Language Audio Retrieval, Non–Speech Audio Retrieval, Graph Retrieval, Imagery Retrieval, Video Retrieval.
Information System Evaluation: Introduction to Information System Evaluation, Measures used in System Evaluations, Measurement Examples – TREC results.

Text Books:

1. Kowalski, Gerald Mark T Maybury, "Information Storage and Retrieval Systems: Theory and Implementation", Springer International Edition, Kluwer Academic Publishers, 2000

Suggested Reading:

1. Recardo Baeza-Yates, Berthier Ribeiro – Neto, "Modern Information Retrieval", Pearson Education, 1999.

2. David A Grossman and Ophir Frieder, "Information Retrieval : Algorithms and Heuristics", 2nd Edition, Springer International Edition, 2004.

3. William B Frakes, Ricardo Baeza – Yates, "Information Retrieval Data Structures and Algorithms", Pearson Education, 1992.

PROGRAMMING LAB - OOSD

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

Course Objectives:
1. To understand the basic operations of case tool (Rational Rose)
2. To know about the representation of Structural and Dynamic modeling
3. Understanding the concepts of Architectural modeling and its representation.

Course Outcomes:

1. Students would have gained the practical knowledge of **st**ructural modeling of Object Oriented Applications through UML.
2. Students would have gained the practical knowledge of dynamic modeling of Object Oriented Applications through UML.
3. Students would have gained the practical knowledge of Forward and Reverse Engineering.

Pre Requisites:

1. Students should have the knowledge of Software Diagrams like DFD's and ER Diagrams.

The students have to implement the following UML modellings on a selected case study by forming themselves into teams in the LAB.

They should use an appropriate case tool like Rational Rose.

- Use case modeling
- Structural modeling
- Behavioral modeling
- Architectural modeling

The outcome of each case study should consists of

1. Use case Diagram
2. Class Diagram
3. Object Diagram
4. Sequence Diagram
5. Collaboration Diagram
6. State chart Diagram
7. Activity Diagram
8. Component Diagram
9. Deployment Diagram

The students should finally submit a technical report on their case study in IEEE format.

Text Books:

1. Ivor Jacbson, Grady Booch, James Rumbaugh, "The Unified Software Development Process", Pearson Education, India, 2008.

2. Curtis HK T Sang, Clarence SW Lau, Ying K. Leung, "Object-Oriented Technology: from Diagram to Code with Visual Paradigm for UML" 1st Edition, McGraw-Hill Science/Engineering/Math, *2005.*

Suggested Reading*:*

1. Grady Booch, James Rumbaugh, Ivor Jacbson, "The Unified Modeling Language – User Guide", 2nd Edition, Pearson Education, India, 2007.

2. Grady Booch, Rabert A. Maksimehuc and Three more, " Object Oriented Analysis and Design with Applications", 3rd Edition, Pearson Education, 1991.

3. Craig Larman, "Applying UML and Patterns: An Introduction to Object Oriented Analysis and Design and Iterative Development", 3rd Edition, Pearson Education, 2008.

PROGRAMMING LAB - MWT

Instruction	3 Periods per week
Duration of Main Examination	3 Hours
Main Examination	50 Marks
Sessional	25 Marks
Credits	2

Course Objectives:

1. To understand the remote method invocation.
2. To gain knowledge in Java Beans and Enterprise java beans
3. To gain knowledge in .NET programming using C# programming language.

Course Outcomes:

1. To practice web service programs through ejbs
2. To practice computer applications through C# programming language.

Pre Requisites:

1. A strong knowledge on Computer programming is required.
2. A knowledge on Java Script and VB Script is required
3. Knowledge on Web programming is required.

1. Create a Distributed name Server (like DNS) RMI.
2. Create a Java Bean to draw various graphical shapes and display it using or without using BDK.
3. Develop an enterprise Java Bean for student Information System.
4. Develop an enterprise Java Bean for Library operations.
5. Create and invoke Web Services.
6. Develop an application for converting the currency values using .NET.
7. Develop an application for browsing CD catalogue using .NET.
8. Develop a Student Information System Forms using .NET and store data into database.
9. Develop a Library Information System Forms using .NET and store data into database.
10. Implement a Sample Inventory Management System using .NET and store data into database.

Text Book:

1. Robert Orfali, Dan Harkey and Jeri Edwards, "The Essential Client / Server Survival Guide", Galgotia Publications Pvt. Ltd, 2002.

Suggested Reading:

1. Tom Valesky, "Enterprise Java Beans", Pearson Education, 2002.

2. John Sharp, Job Jagger, "Microsoft Visual C#.NET step by step", Prentice hall of India Private Ltd, 2003.

SEMINAR

Instruction   3 Periods per week
Sessional   25 Marks

Oral presentation is an important is an important aspect of technical and objective of the seminar is to prepare the student for a systematic and independent study of the state of the art topics in a broad area of thread specifications

Seminar topics may be chosen by the students with advice from the faculty members . Students are to be exposed to the following aspects of the seminar presentation.

- Literature Survey
- Organization of the material
- Presentation of PPTs
- Technical writing

Each student is required to:

1. Submit one page synopsis before the seminar talk for display on the notice board
2. Give a 15 minutes presentation through OHP, PC, Slide projector followed by a 5 minutes discussions
3. Submit a report on the seminar topic with a list of reference and slided used

Seminars are to be scheduled from the 3rd week to the last week of semester and any change in schedule should be discouraged.

For award of Sessional marks students are to be judged by at least two faculty members on the basis of an oral and written presentation as sell as their involvement in the discussion.

PROJECT WORK

Instruction   6 Periods per week
University Examination   Viva-Voce
University Examination   Grade
Sessional   50 Marks

Sixth Semester of the MCA course is exclusively meant for project work. Project has to be carried out by each student individually in a period of 15 weeks of duration. Students should submit a synopsis at the end of 2nd week in consultation with the Project Guide. The synopsis should consist of definition of the problem, scope of the problem and plan of action. After completion of eight weeks students are required to present a Project Seminar on the topic covering the aspects of analysis, design and implementation of the project work.

At the end of the semester the students are required to present themselves for a University Vive-voce examination in which each student will be awarded with a grade.

 A committee consisting of two faculty members of the respective college along with a guide will evaluate the project and award internal marks.

PROJECT SEMINAR

Instruction   3 Periods per week
Sessional   25 Marks

Each student will be required to:

1. Submit one page of synopsis on the project work for display on notice board.
2. Give a 20 minutes presentation followed by 10 minutes discussion.
3. Submit a technical write-up on the project.

At least two teachers will be associated with the Project Seminar to evaluate students for the award of sessional marks which will be on the basis of performance in all the 3 items stated above.

The project seminar presentation should include the following components of the project:

- Problem definition and specification.
- Literature survey, familiarity with research journals.
- Broad knowledge of available techniques to solve a particular problem.
- Planning of the work, preparation of bar(activity) charts
- Presentation-oral and written.