

MVN University, Palwal
School of Computer and Information Science
MASTER OF COMPUTER APPLICATION

Annexure 3

MCA Semester-I							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Mathematical Foundation of Computer Science	CAL-501	4	1	0	5	5
2	C Programming	CAL-503	4	1	2	7	6
3	Internet Concept & Web Designing	CAL-505	4	1	2	7	6
4	Basic of Digital Design	ECL- 535	3	1	0	4	4
5	Communicative English	AHL-505	4	0	0	4	4
6	Soft Skills-I	AHP-501	0	0	2	2	1
Total			19	4	6	29	26
MCA Semester-II							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Object Oriented Programming Using C++	CAL-502	4	1	2	7	6
2	Computer Organization and Architecture	CAL-504	3	1	0	4	4
3	Data Structure	CAL-506	4	1	2	7	6
4	System Analysis and Design	CAL-508	3	1	0	4	4
5	Principle of Management	MSL-518	4	0	0	4	4
6	Soft Skills-II	AHP-502	0	0	2	2	1
7	Environmental Studies	AHL-108	2	0	0	2	AC
Total			20	4	6	30	25

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MCA-III Sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Principal Of Operating System	CAL-601	4	1	2	7	6
2	Data Base Management System	CAL-603	4	1	2	7	6
3	Principal Of Artificial Intelligence	CAL-605	3	1	0	4	4
4	Principal Of Software Engineering	CAL-607	4	0	0	4	4
5	Computer Network	CAL-609	3	1	0	4	4
6	Soft Skills-III	AHP-601	0	0	2	2	1
7	Buzz Session	CAS – 611	0	0	2	2	1
Total			18	4	8	30	26
MCA-IV Sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Advance Computer Architecture	CAL – 602	3	1	0	4	4
2	C# &ASP.NET	CAL – 604	4	1	2	7	6
3	Computer Graphics & Multimedia	CAL – 606	4	1	2	7	6
4	System Programming & Compiler Design	CAL – 608	3	1	0	4	4
5	Elective - 3		4	0	0	4	4
6	Soft Skills- IV	AHP-602	0	0	2	2	1
7	Powwow	CAS – 612	0	0	2	2	1
Total			18	4	8	30	26
S. No.	Elective -3	Code	L	T	P	Total Hrs	Credit
1	E-Commerce	CAL-614	4	0	0	4	4
2	Management Information System	CAL-616	4	0	0	4	4

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MCA-V sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Advanced Java Technology	CAL – 701	4	1	2	7	6
2	Analysis and Design of Algorithms	CAL – 703	4	1	2	7	6
3	Dataware house and data mining	CAL – 705	4	0	0	4	4
4	Network Security	CAL – 707	4	0	0	4	4
5	Elective - 4		4	0	0	4	4
6	Soft Skills-V	AHP-701	0	0	2	2	1
7	Clambake	CAS – 709	0	0	2	2	1
Total			20	2	8	30	26
S. No.	Elective -4	Code	L	T	P	Total Hrs	Credit
1	Distributed Operating System	CAL-711	4	0	0	4	4
2	Software Project Management	CAL-713	4	0	0	4	4
MCA-VI sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Major Project	CAD-702	0	0	20	20	10

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CAL-501	Mathematical foundation of Computer Science	(L:4	T:1	P:0) Credit :5
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Objective : To provide the basic architecture about the mathematical concept of computer that will help the students to understand that how the data is stored and traverse in computer.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT - 1

Relation: Relations, Properties of Binary relation, Matrix representation of relations, Closures of relations, Equivalence relations, Partial order relation. Function: Types, Composition of function, Recursively defined function.

Algebraic Structures: Properties, Semi group, Monoid, Group, Abelian group, Subgroup, Cyclic group, Cosets Normal Subgroups, Lagranges Theorem, Permutation groups.

UNIT - 2

Graph Theory: Graphs Theory: Euler and Hamiltonian path and circuits, Coloring, Directed Graphs Planar Graphs, Matrix Representation of Graphs, Weighted Graphs, Network flows, Max-flow Min-cut theorem.

UNIT-3

Propositional Logic: Propositions, logical operations, Tautologies, Contradictions, Logical implication, Logical equivalence, Normal forms, Theory of Inference and deduction. Predicate Calculus: Predicates and quantifiers. Mathematical Induction.

SECTION - B

UNIT - 4

Lattices and Boolean Algebra: Introduction, Partially Ordered Set, Hasse diagram, Well ordered set, Lattices, Properties of lattices, Bounded lattices, Complemented and Distributive lattices, Boolean Algebra.

UNIT - 5

Introduction to defining language, Kleene Closure, Arithmetic expressions, Chomsky Hierarchy, Regular expressions, Generalized Transition graph.

UNIT-6

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Annexure 3

Conversion of regular expression to Finite Automata, NFA, DFA, Conversion of NFA to DFA, Optimizing DFA, FA with output: Moore machine, Mealy machine, Conversions, Introduction to Turing Machine.

Suggested Reading:

Text Books:

1. Lipschutz, Seymour: Discrete Mathematics, Schaums Series
2. C.L.Liu: Elements of Discrete Mathematics, McGraw Hill.
3. Kenneth H. Rosen: Discrete Mathematics and its applications, TMH.

Reference Books:

1. Doerr Alan & Levasseur Kenneth: Applied Discrete Structures for Computer Science, Galgotia Pub. Pvt. Ltd.
2. Trembley, J.P & R. Manohar: Discrete Mathematical Structure with Application to Computer Science, TMH.
3. Bubo Ram: Discrete Mathematics, Vinayek Publishers, New Delhi.
4. Gersting: Mathematical Structure for Computer Science, WH Freeman & Macmillan.

Note: Latest and additional good books may be suggested and added from time to time.

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CAL- 503	C Programming	L	T	P	Cr
		4	1	2	6

Objective:

To provide sound conceptual understanding of the fundamental and advanced concept of programming.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

UNIT-1

Evolution of information processing: Concept of data and information, data processing. Hardware - CPU, Storage Devices & Media, VDU, Input ` Output, Devices, Type of Software - System Software, Application Software. Overview of OS. Programming Languages and its Classification, Compiler, Interpreter Linker, Loader. Binary Number. Impacts, Computer Crimes, Viruses and their remedial solutions.

UNIT -2

Concept of variables and constants, structure of a C program. Operators & Expressions: Arithmetic, Unary, Logical, Bit-wise, Assignment & Conditional Operators, Library Functions, Control Statements: while, do..While, for statements, Nested loops, if..else, switch, break, continue and goto statements, Comma operator.

UNIT -3

Functions: Defining & Accessing : Passing arguments, Function Prototype, Recursion, Use of Library Functions, Storage Classes: Automatic, External and Static Variables (Register), Arrays: Defining & Processing, Passing to a function, Multidimensional Arrays.

SECTION - B

UNIT-4

String: Operations of Strings (String handling through built-in & UDF; Length, Compare Concatenate, Reverse, Copy, .Character Search using array).Pointers: Declarations, Passing to a function, Operations on Pointers, Pointers & Arrays, Array of Pointer, Pointer Arithmetic, Array accessing through pointers Pointer to structure, Pointer to functions, Function returning pointers, Dynamic Memory Allocations.

UNIT - 5

Structures: Defining & Processing, Passing to a function, Unions (Array within structure, Array of structure, Nesting of structure, Passing structure and its pointer to UDF, Introduction to Unions and its Utilities)

UNIT-6

Data Files: Open, Close, Create, Process Unformatted Data Files. (Formatted Console I/O functions, Unformatted Console I/O functions, Modes Of Files, Use Of fopen(), fclose(), fgetc(), fputc(), fgets(), fplintf(), fscanf(), fread(), fwriteO, Command Line Arguments). Documentation, debugging, C Processors, Macros. Examples illustrating structured program development methodology and use of a block_structured algorithmic language to. solve specific problems.

Suggested Reading:

Text Books:

1. Fundamentals of Computers & Programming with C, A.K. Sharma, Dhanpat Rai Publishing.
2. Gill, Nasib Singh: Essentials of Computer and Network Technology, Khanna Books Publishing Co., New Delhi.
3. Kenneth.A.: C problem solving and programming, Prentice Hall.
4. Y. Kanetkar: Let us C, BPB Publication
5. E. Balaguruswamy: Programming in C, Tata McGraw Hill.

Reference Books:

1. Gottfried, B.: Theory and problems of Programming in C, Schaum
2. Sanders, D.: Computers Today, Tata McGraw-Hill.
3. Rajender Singh: Application of IT to Business, Ramesh Publishers
4. Keminghan & Ritchie: The C Programming Language, PHI.
5. H. Schildt: C-The Complete Reference,,Tata McGraw Hill.

C Prograaming Lab

- 1 Introduction of Turbo C IDE and Programming Environment
- 2 C Building Blocks
- 3 Looping constructs in C-Language
- 4 Nested looping
- 5 Decision making the if and if-else structure
- 6 Decision making the Switch case and conditional operator
- 7 Debugging and Single-Stepping of C Programs
- 8 Functions in C-Language programming
- 9 Preprocessor Directives
- 10 Arrays in C (single dimensional)
- 11 Arrays in C (Multidimensional)
- 12 Learning Text and Graphics modes of display in C
- 13 Structures
- 14 Pointers in C-Language
- 15 Pointers with arrays and function
- 16 Filing in C-Language

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CAL- 505	Internet Concept & Web Designing	L	T	P	Cr
		4	1	2	6

Objective:

To have a fundamental understanding of the design, performance and state of the art of Internet. Topics covered include state of the art E-mail, Internet and research.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT-1

Introduction to World Wide Web, Introduction to w3 consortium Surfing & searching the www: Directories search engines and Meta search engines, search fundamentals, search strategies, working of the search engines, Telnet and FTP. Browser architecture & types, HTTP, URL, Web page types, Using Plug-ins. User generated Content: Blogs & Wikies.

UNIT - 2

Introduction to E-mail, advantages and disadvantages, message components, mailer features, E-mail management, Mime types, Newsgroups, mailing lists, chat rooms.

UNIT - 3

Introduction to networks and Internet: history, working of Internet, Internet Congestion. Collaborative computing. Modes of Connecting to Internet, Internet Service Providers (ISPs), Introduction to IETF, Internet address, standard address, DNS, Introduction to IPv6.

SECTION - B

UNIT - 4

HTML document, Tags & their Types, Images & tables. Java script language, Client and Server Side Programming in Java script. Forms and data in Java script, XML basics.

UNIT - 5

Introduction to Web Servers: HS, Apache; Microson Personal Web Server. Accessing & using Apache server.

UNIT-6

Introduction to cryptography: Encryption schemes, including private key, public key, symmetric &

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asymmetric, Encryption schemes, Secure Web document, Digital Signatures, Firewalls, Proxy servers, HTTPS, SSL.

Suggested Reading:

Text Books:

1. Fundamental of Internet & the world wide web, Raymond Green Law. & Ellen Hepp, 2001, TMH

Reference Books:

1. Internet & Web Design, Ramesh Bangia, LaXmi Publication
2. Complete Reference, Internet, TMH.
3. Pankaj Sharma, Web Administration, S.K. Kataria & Sons.

Internet concepts and web designing lab

1. Introduction to HTML
2. WAP to use different font tags and styles
3. WAP to use Marquee tags
4. WAP to List
5. WAP to create Table
6. WAP to insert an Image
7. WAP to implement Frames
8. WAP to use different arithmetic operations

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Annexure 3

ECL- 535	Basic of Digital Design	L	T	P	Cr
		3	1	0	4

Objective :

To provide the knowledge of different digital devices and their functioning.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

Section A

Unit-I

Digital Design and Binary Numbers: Binary Arithmetic, Negative Numbers and their Arithmetic, Floating point representation, Binary Codes, Cyclic Codes, Error Detecting and Correcting Codes, Hamming Codes.

Unit II

Minterm and Maxterm Realization of Boolean Functions, Gate-level minimization: The map method up to four variable, don't care conditions, SOP and POS simplification, NAND and NOR implementation, Quine Mc-Cluskey Method (Tabular method).

Unit-III

Combinational Logic: Combinational Circuits, Analysis Procedure, Design Procedure, Binary Adder, Subtractor, Code Converters, Parity Generators and Checkers, Decimal Adder, Binary Multiplier, Magnitude Comparator, Decoders, Encoders, Multiplexers, Hazards and Threshold Logic

Section B

Unit-IV

Memory and Programmable Logic Devices: Semiconductor Memories, RAM, ROM, PLA, PAL, Memory System design.

Unit-V

Synchronous Sequential Logic: Sequential Circuits, Storage Elements: Latches, Flip Flops, Analysis of Clocked Sequential circuits, state reduction and assignments, design procedure.
Registers and Counters: Shift Registers, Ripple Counter, Synchronous Counter, Other Counters.

Unit-VI

Asynchronous Sequential Logic: Analysis procedure, circuit with latches, design procedure, reduction of state and flow table, race free state assignment, hazards.

References:

1. M. Morris Mano and M. D. Ciletti, "Digital Design", Pearson Education
2. A.K .Singh, "Foundation of Digital Electronics and Logic design", New Age international

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- 3.M. Rafiquzzaman, “Fundamentals of Digital Logic and Microcomputer Design”, Wiley Dreamtech Publication.
- 4.ZVI Kohavi, “Switching and Finite Automata theory”,Tata McGraw Hill
- 5 C.H Roth,Jr., “Fundamentals of Logic Design”, ,Jaico Publishing
- 6.Rajaraman & Radhakrishnan, “Digital Logic and Computer Organization”,PHI Learning Private Limited,Delhi India.

AHL-505	COMMUNICATIVE ENGLISH	L	T	P	Credits
		4	0	0	4

SECTION-A

UNIT-1: INTRODUCTION

- Concept of communication
- Verbal and non-verbal modes of communication
- Function and Role of effective communication
- The process of communication – the four skills of listening, speaking, reading and writing (LSRW)

UNIT-2: ACTIVE LISTENING AND EFFECTIVE READING

- Listening skills – reiteration and application of concepts
- Reading skills – reiteration and application of concepts
- Listening Comprehension - speeches (general and business) professional texts (based on business reports/work related issues/ current affairs/ environment etc).

UNIT-3: PROFESSIONAL SPEAKING

- Speaking skills – reiteration of concepts
- Group Discussion with evaluation
- Debate
- Presentation with evaluation
- Jam/ Extempore
- Mock Interview and Meetings with evaluation
- Case Studies and SWOT analysis

SECTION-B

UNIT-4: BUSINESS WRITING

- Principles of Communicative Writing
- Business Letters – application, enquiry, complaints, reservations
- E –Mails
- CV Writing
- Reports – a) Graph Sales Report b) Field/Survey Report c) Minutes and Agenda

UNIT-5: FUNCTIONAL GRAMMAR AND BUSINESS VOCABULARY

- English for Specific Purposes – vocabulary related to the fields of Hospitality, Travel and Tourism, Airlines, Banking, Media and Corporate.
- Phrasal Verbs, Word Pairs, Synonyms and Antonyms
- Use of Tense & Modals

AHP-501	SOFT SKILLS – 1	L	T	P	Credit
		0	0	2	1

(Common for MCA and Integrated MCA)

SECTION-A

UNIT-1: INTRODUCTION

- Soft Skills – What and Why?
- Ingredients
- Utility & Scope

UNIT-2: BETTER ENGLISH USAGE AND ACCENT TRAINING

- Introduction to phonetic sounds
- Stress
- Intonation

UNIT-3: ORAL COMMUNICATION

- Art of Conversation
- Speaking at home, office/college, in the market, bank, airport/ railway station and with government and private officials

SECTION-B

UNIT-4: WRITTEN COMMUNICATION

- Art of Written Communication
- Domains of Written Communication : Letter Writing , Resume & covering letter, E-mail

UNIT-5: PRESENTATION SKILLS

- Tools of Presentation Skills
- Power Point Presentation

UNIT-6: WINNING SKILLS:

- Development of leadership skills in the light of all professional needs
- Negotiation
- Presentation
- Risk taking
- Managing Challenges
- Thinking ahead

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Annexure 3

CAL- 502	Object Oriented Programming Using C++	L	T	P	Cr
		4	1	2	6

Objective:

To relay the theoretical and practical fundamental knowledge of most commonly used object oriented language which deals with objects and real time applications.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT - 1

Introduction: Introducing Object-Oriented Approach Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new operators Scope Resolution operators, tokens, keywords.

UNIT - 2

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behavior of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Metaclass/abstract classes.

UNIT - 3

Operator overloading: Introduction; fundamentals of operator overloading; restrictions on operators overloading; operator functions as class members vs. as friend functions; overloading; <<; >> overloading unary operators; overloading binary operators.

SECTION - B

UNIT - 4

Inheritance; virtual functions and polymorphism: Introduction; inheritance: base classes and derived classes; protected members; casting base-class pointers to derived-class pointers; using member functions; overriding base_class members in a derived class; public; protected and private inheritance; using constructors and destructors in derived classes.

Unit -5

Files and i/o streams: Files and streams; creating a sequential access file; reading data from a sequential

access me; updating sequential access files; random access files; creating a random access file; writing data randomly to a random access file; reading data sequentially from a random access file.

Unit - 6

Templates & exception handling: Function templates; overloading template functions; class template; templates and inheritance; templates and friends; templates and static members; basics of C++ exception handling: try; throw; catch; throwing an exception; catching an exception.

Suggested Readings:

- 1, Data Structure using C, Pearsons Publishing.
- 2.Data Structures & Algorithm using C by RS.Salaria.
- 3.Lipschutz, "Data Structures" Schaums Outline Series, TMH

Reference Books:

- 1.Aaron M. Tenebaum, Yedidyah, Langsam and Moshe J. Augenstein "Data Structure using C / C++", PHI
- 2.Horowitz and Sahani, "Fundamentals of Data Structures", Galgotia Publication
- 3.R. Kruse et.al, "Data Structures and Program Design in C", Pearson Education

Note: Latest and additional good books may be suggested and added from time to time

Object Oriented Programming Lab

Program 1:- Given that an EMPLOYEE class contains the following members:

- a. Data members: Employee_number, Employee_name, Basic , DA, IT, Net_Sal.
- b. Member functions: To read data, to calculate net_sal and to print datamembers.

Write a C++ program to read data on employees and compute the net_sal of each employee (DA =52 % of basic and income tax=30% of the gross salary)

Program 2:- Define a STUDENT class with USN, name and marks in 3 test of a subjects. Declare an array of 10 STUDENT objects. Using appropriate functions, find the average of the two better marks for each student. Print the USN , name and the average marks of all the subjects.

Program 3: Write a C++ program to create a class called COMPLEX and implement the following overloading functions ADD that return a complex number:

- a. ADD(a,s2)-where 'a' is an integer (real part) and s2 is a complex number.
- b. ADD(s1,s2)-where s1 and s2 are complex numbers.

Program 4:- Write a C++ program to create a class called DATE. Accept two valid dates in the form dd/mm/yy. Implement the following operations by overloading the operators + and - . After every operation display the results by overloading the operator <<.

- a) no_of_days=d1-d2; where d1 and d2 are DATE objects.d1>=d2 and no_of_days is an integer.
- b) d2=d1-no_of_days; where d1 is a DATE object and no_of_days is an integer.

Program 5:Create a class called MATRIX using two-dimensional array of integers. Implement the following operations by overloading the operator ++ which checks the compatibility of two matrices to be added and subtracted. Perform the addition and subtractions by overloading the + and - operators respectively. Display the result by overloading the operator << if(m1==m2) then m3=m1+m2 and m4=m1-m2 else display error.

Program 6: Write a C++ program to create a class called OCTAL which has the characteristics of an octal number. Implement the following operations by writing an appropriate constructor and an overload operator +.

- a. OCTAL h=x; where x is an integer.
- b. Int y=h + k; where h is an OCTAL object and k is an integer.

Display the OCTAL result by overloading the operator <<. Also display the values of h and y.

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Annexure 3

CAL- 504	Computer Organization & Architecture	L	T	P	Cr
		3	1	0	4

Objective: To provide basic knowledge of internals of microprocessor, its architecture, components, terminologies, etc. at minute level and ultimately about the working of a digital computer hardware as a whole.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT - 1

Number representation; fixed and floating point number representation, IEEE standard for floating point representation. Error detection and correction codes: Hamming code. Digital computer generation.

UNIT - 2

Computer types and classifications, functional units and their interconnections, buses, bus architecture, types of buses and bus arbitration. Register, bus and memory transfer.

UNIT-3

Addition and subtraction of signed numbers, look ahead carry adders. Multiplication: Signed operand multiplication, Booths algorithm and array multiplier. Division and logic operations. Floating point arithmetic operation Processor organization, general register organization, stack organization and Addressing modes

SECTION - B

UNIT - 4

Instruction types, formats, instruction cycles and sub cycles (fetch and execute etc) ,micro-operations, execution of a complete instruction. Hardwire and micro programmed control: microprogramme sequencing, wide branch addressing, and microinstruction with next address field, pre-fetching microinstructions, concept of horizontal and vertical microprogramming.

UNIT - 5

Basic concept and hierarchy, semiconductor RAM memories, 2D & 2 I/2D memory organization. ROM memories. Cache memories: concept and design issues 9 performance, address mapping and replacement) Auxiliary memories: magnetic disk, magnetic tape and optical disks Virtual memory: concept implementation.

UNIT - 6

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Peripheral devices, I/O interface, I/O ports, Interrupts: interrupt hardware, types of interrupts and exceptions. Modes of Data Transfer: Programmed I/O, interrupt initiated I/O and Direct Memory Access., I/O channels and processors. Serial Communication: Synchronous & asynchronous communication, standard

Suggested Reading:

Text Books:

1. Mano, "Computer System Architecture", Pm

Reference Books:

1. Computer Organization & Architecture By SPS Saini

2. Tannenbaum, "Structured Computer Organization, Pm

Note: Latest and additional good books may be suggested and added from time to time.

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Annexure 3

CAL- 506	Data Structure	L T P	Cr
		4 1 2	6

Objective:

To relay the theoretical and practical fundamental knowledge of most commonly used data structures and algorithms.

THEORY:

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT - 1

Basic Terminology, Elementary Data Organization, Algorithm, Efficiency of an Algorithm, Time and Space Complexity, Asymptotic notations: Big-Oh, Time-Space trade-off. Abstract Data Types (ADT). Arrays: Definition, Single and Multidimensional Arrays, Representation of Arrays: Row Major Order, and Column Major Order, Application of arrays, Sparse Matrices and their representations. Array Implementation and Dynamic Implementation of Singly Linked Lists, Doubly Linked List, Circularly Linked List, Doubly Circular Linked List, Operations on a Linked List. Insertion, Deletion, Traversal.

UNIT - 2

Stacks: Abstract Data Type, Primitive Stack operations: Push & Pop, Array and Linked Implementation of Stack in C, Application of stack: Prefix and Postfix Expressions, Evaluation of postfix expression, Recursion, Principles of recursion.

UNIT - 3

Queues: Operations on Queue: Create, Add, Delete, Full and Empty, Circular queues, Array and linked implementation of queues in C, Dequeue and Priority Queue.

SECTION - B

UNIT - 4

Trees: Basic terminology, Binary Trees, Binary Tree Representation: Array Representation and Dynamic Representation, Complete Binary Tree, Algebraic Expressions, Extended Binary Trees, Array and Linked

Representation of Binary trees, Tree Traversal algorithms: Inorder, Preorder and Postorder, Threaded Binary trees, Traversing Threaded Binary trees, Huffman algorithm.

Graphs: Terminology, Sequential and linked Representations of Graphs: Adjacency Matrices, Adjacency List, Adjacency Multi list, Graph Traversal : Depth First Search and Breadth First Search, Connected Component, Spanning Trees, Minimum Cost Spanning Trees: Prim and Kruskal algorithm. Shortest Path algorithm: Warshal Algorithm and Dijkstra Algorithm

UNIT - 5-

Searching : Sequential search, Binary Search, Comparison and Analysis Internal Sorting: Insertion Sort, Selection, Bubble Sort, Quick Sort, Two Way Merge Sort, Heap Sort, Radix Sort, Practical consideration for Internal Sorting.

UNIT - 6

Files: Sequential file organization, creating updating retrieving from sequential files advantages and disadvantages of sequential file organization. Data representation and density, parity and error control techniques, devices and channels, double buffering and block buffering, handling sequential files in C language, seeking, positioning, reading and writing binary files in C. External Sorting and merging files k way and polyphase merge

Suggested Reading:

Text Books:

I. Data Structures : Horowitz, Sahni, Galgotia Publications

Reference Books

1.Data Structures , Lipsutch , Schaum Series

Note: Latest and additional good books may be suggested and added from time to time.

Data Structure Lab

1. Write a program to calculate sum of n numbers using 1D array.
2. Write a program to find the transpose of a matrix.
3. Write a program to multiply two matrices.
4. Write a program to calculate factorial of a number using recursion.
5. Write a program to search a number in an array using linear search.
6. Write a program to search a number in an array using Binary search.
7. Write a program to implement insertion sort.
8. Write a program to implement stack using array.
9. Write a program to implement queue using array.
10. Write a program for implementation of creation, insertion, deletion, and searching operation in singly linked list.
11. Write a program to implement stack using linked list.
12. Write a program to implement queue using linked list.
13. Write a program to implement circular linked list.
14. Write a program for implementation of creation, insertion, deletion, and searching operation in doubly linked list.
15. Write a program to traverse the graph in Depth first Traversal.

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Annexure 3

CAL- 508	System Analysis & Design	L T P	Cr
		3 1 0	4

Objective:

To have the fundamental concept of system, how its work, system design and planning and many more about system.

Note: For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two questions from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT - 1

Introduction: introduction to system, characteristics of system, component of system, type of system, Models and contemporary systems Analysis : Effective communication in systems analysis: Tools of the systems Analysis, System development life cycle, role of system analyst.

UNIT -2

System Analysis: What is planning, need of planning, feasibility study, steps in feasibility study, feasibility report, information gathering tool, tools of structured analysis

UNIT-3

A structured Approach to System Design: Structured Top-down design, Logical design requirements, Forms requirements design, CRT screen design; Program specification, development completion schedule, Structured Walk Through.

SECTION - B

UNIT - 4

System Cost Determination: System costs and system benefits, comparative cost analysis, data Processing costs, DP cost centre concept

UNIT -5

Project Management and Control: Development of standards, project control, Gantt Charts, PERT & CPM.

Systems Conversion and Implementation: Planning considerations, Conversions methods, systems follow-up quality assurance of new~systems.

UNIT - 6

Testing: What is testing, what is the need of testing? Quality assurance, audit trail.

Suggested Reading:

Text Books:

1. System Analysis & Design, Elias M. Awad. Galgotia Publications.
2. Systems analysis and design, Kenneth E. Kendall, Julie E, Prentice Hall, 2001

Reference Books:

1. System Analysis & Design, George M. Makaras, Prentice Hall, 2001
2. System Analysis & Design, Hoffer, Pearson Education

MSL- 518 Principles of Management

L.T.P-4.0.0

Credits 4

Unit-I Fundamentals of Management Concepts, Nature, Importance; Management: As an Art and Science, Management as a profession, Professionalization of Management in India, Management vs. Administration, Levels of Management.

Unit-II Human Relations: Evolution of Management: Taylor and Scientific Management, Fayol's Administrative Management, Bureaucracy, Hawthorne Experiments and Human Relations, Social System Approach, Decision Theory Approach, Social Responsibility of Management.

Unit-III Management Functions: Introduction to functions of Management, Planning: Nature, Significance, Types, Process, limitations to Effective Planning, Decision Making.

Unit-IV Organizing: Concept, Forms of Organizational Structure, Departmentation, Span of Control, Delegation of Authority, Authority and Responsibility, Organizational Design.

Unit-V Decision making and Motivation: Basics of Motivation: Concept, Importance of motivation , theories of Motivation, Methods for improving Motivation, Manpower Planning, Job Design.

Unit-VI Leadership: Concept of Leadership: importance, Functions of Leaders, Leadership Styles, **Controlling:** Concept, Characteristics, Types of control, Significance, Process, Relationship between planning and control.

Text Books:

1. C.B Gupta, Management Concepts and Application, Sultan Chand.
2. Robbins S.P & Decenzo David A., Fundamentals of Management; Essential Concepts and Applications, Pearson Education.
3. P.K Aggrawal, Fundamentals of Management.
4. T. N Chabra, Principles of Management.

Reference Books:

1. Prasad L.M. - Principles and Practice of Management
2. Stoner & Wankel - Management
3. Peter F. Drucker - Practice of Management
4. Harold Koontz, Aryasri & Heniz Weirich - Principles of Management - Tata McGraw-Hill

AHP-502	SOFT SKILLS – 2	L	T	P	Credit
		0	0	2	1

(Common for MCA and Integrated MCA)

SECTION-A

UNIT-1: TEAM BUILDING

- Concept of Group
- Consideration and Cooperation
- Team building practices through group exercises
- Team task / Role play
- Ability to work together

UNIT-2: CRITICAL THINKING

- Analyse
- Prioritise
- Evaluating the problems
- Understands how to use decision making skills to support mission
- Demonstrated systems thinking ability
- External environments

UNIT-3: BUSINESS ETIQUETTE AND PERSONAL GROOMING

- Introduction to Etiquette
- Various accepted practices in the corporate world
- Unsaid codes of conduct
- Personality, manners, awareness and positive attitude

SECTION-B

UNIT-4: ORGANIZATIONAL SKILLS

- Understanding organizational mission
- Understanding ethics concerned with public trust and organization
- Demonstrates ability in conflict management and dispute resolution
- Understanding how to acquire needed resources
- Understanding organizational culture

UNIT-5: INNOVATION

- Able to manage change
- Understands creative processes
- Capable of systems thinking
- Adept at framing issues
- Comfortable with risk taking

AHL-108	ENVIRONMENTAL STUDIES	L	T	P	Cr.
		2	0	0	AC

Objective:

This subject provides the basic knowledge about the environment, factors affecting environment etc.

Theory:

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT-I

The Multidisciplinary Nature of Environmental studies: – Nature, scope and importance, need for public awareness.

UNIT-II

Natural resources: – Renewable and non-renewable resources, natural resources and associated problems:

- (a) **Forest resource:** Use and over-exploitation, deformation and case studies. Timber extraction, mining, dams and their effects on forests and tribal people.
- (b) **Water resources:** Use and overutilization of surface and ground water, flood, drought, conflicts over water, dams-benefit and problem.
- (c) **Mineral resources:** Use and exploitation, environmental effects of extracting and using mineral resources.
- (d) **Food resources:** World food problems, changes caused by agriculture and over-grazing, effects of modern agriculture, fertilizer-pesticide problem, water logging, salinity.
- (e) **Land resource:** Land as a resource, land degradation, man induced landslides, soil erosion and desertification.

UNIT-III

Ecosystems :- Concept, structure and function of an ecosystem; energy flow in the ecosystem; ecological succession; food chains, food webs and ecological pyramids; types of ecosystem – forest ecosystem, grassland ecosystem, aquatic ecosystems.

SECTION-B

UNIT-IV

Environmental Pollution: – Definition, cause, effects and control measures of different types of pollutions – air pollution, water pollution, soil pollution, marine pollution, noise pollution, thermal pollution, nuclear hazards; solid waste management- causes, effects and control measures of urban and industrial wastes; role of an individual in prevention of pollution.

UNIT-V

Social issues and environment:– Urban problems related to energy, water conservation, rain water harvesting, resettlement and rehabilitation of people and its problems; global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust.

UNIT-VI

Human population and environment :-Population growth, variation among nation, population explosion-family welfare programme, environment and human health, Human rights, HIV/AIDS, woman and child welfare.

SUGGESTED READINGS:

Text Books:

1. Rajagopalan R, Environmental Studies, Oxford University Press, New Delhi

Reference Books:

1. Kaushik Anubha, C.P. Kaushik, Perspective in Environmental Studies, New Age International (P) Ltd. Publishers

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2. Joseph Benny, Environmental Studies, Tata McGraw Hill Publishing Company Ltd., New Delhi
3. Ubaroi, N.K., Environment Management, Excel Books, New Delhi

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Annexure 3

MCA-III Sem / Integrated (BCA+MCA)						
Name of the Paper	Code	L	T	P	Total Hrs	Credit
Principal Of Operating System	CAL-601	4	1	2	7	6
Data Base Management System	CAL-603	4	1	2	7	6
Principal Of Artificial Intelligence	CAL-605	3	1	0	4	4
Principal Of Software Engineering	CAL-607	4	0	0	4	4
Computer Network	CAL-609	3	1	0	4	4
Soft Skills-III	AHP-601	0	0	2	2	1
Buzz Session	CAS – 611	0	0	2	2	1
Total		18	4	8	30	26
MCA-IV Sem / Integrated (BCA+MCA)						
Name of the Paper	Code	L	T	P	Total Hrs	Credit
Advance Computer Architecture	CAL – 602	3	1	0	4	4
C# &ASP.NET	CAL – 604	4	1	2	7	6
Computer Graphics & Multimedia	CAL – 606	4	1	2	7	6
System Programming & Compiler Design	CAL – 608	3	1	0	4	4
Elective - 3		4	0	0	4	4
Soft Skills- IV	AHP-602	0	0	2	2	1
Powwow	CAS – 612	0	0	2	2	1
Total		18	4	8	30	26
Elective -3	Code	L	T	P	Total Hrs	Credit
E-Commerce	CAL-614	4	0	0	4	4
Management Information System	CAL-616	4	0	0	4	4

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Annexure 3

CAL-601	PRINCIPALS OF OPERATING SYSTEM	L	T	P	Cr
		4	1	2	6

OBJECTIVE:

To provide the knowledge about working of operating systems, different types and purpose of operating systems.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

UNIT-I

Introduction to operating system: Overview of all system software: operating system, compiler, assembler, linker, loader; Operating system fundamentals: Various architecture of Operating system, characteristics, and services; Types of operating system: batch operating system, multiprogramming, multitasking, time sharing, real operating system.

UNIT-II

Process Management: process concept, process state, Process control box (PCB), and Process scheduling, Scheduling Queues, Schedulers Scheduler, types of scheduler (long, short, medium term scheduler), Context Switching.

UNIT-III

Memory Management and Virtual Memory - Logical versus Physical Address Space, Swapping, Contiguous Allocation, Paging, Segmentation, Segmentation with Paging. Demand Paging, Performance of Demanding Paging, Page Replacement, Concept of Virtual Memory.

SECTION B

UNIT-IV

Deadlocks - System Model, Dead locks Characterization, Methods for Handling Deadlocks Deadlock Prevention, Deadlock Avoidance, Deadlock Detection, and Recovery from Deadlock.

UNIT-V

File System: File concept (Types of files, operation on files, attributes of files, and access methods of file), directory structures, various allocation methods and disk scheduling.

UNIT-VI

I/O Systems: I/O Hardware (I/O devices-character and block oriented devices, device controller, port), I/O software (Device driver, Polling, interrupt, DMA).

Text Books:

- Operating System Concepts by Silberchatz et al, 5th edition, 1998, Addison-Wesley.
- Modern Operating Systems by A. Tanenbaum, 1992, Prentice-Hall.
- Operating Systems Internals and Design Principles by William Stallings, 4th edition, 2001, Prentice- Hall

Reference Books:

- Operating System By Peterson , 1985, AW.
- Operating System By Milankovic, 1990, TMH.
- Operating System Incorporating With Unix & Windows By Colin Ritche, 1974, TMH.
- Operating Systems by Mandrik & Donovan, TMH
- Operating Systems By Deitel, 1990, AWL.
- Operating Systems – Advanced Concepts By Mukesh Singhal , N.G. Shivaratri, 2003, T.M.H

Lab :

1. System calls: Linux OS
2. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for FCFS and SJF. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
3. Given the list of processes, their CPU burst times and arrival times, display/print the Gantt chart for Priority and Round robin. For each of the scheduling policies, compute and print the average waiting time and average turnaround time.
4. Write a C Program to simulate the fork () & exit() system call.
5. To write a C Program to perform the system call to get the process id
6. To write a c program to develop an application using Inter process Communication (IPC) using pipes.

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Annexure 3

CAL-603	Data Base Management System	L T P	Cr
		4 1 2	6

OBJECTIVE:

To provide knowledge about various organizations and management information systems, keeping in view the aspects of share ability, availability, resolvability and integrity.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT-I Introduction: Overview of database Management System, Various views of data, data independence, data Models, Introduction to Database Languages. Advantages of DBMS over file processing systems, Responsibility of Database Administrator. Three levels architecture of Database Systems, Client/Server Architecture.

UNIT-II Data Models: E-R Diagram (Entity Relationship), mapping Constraints, Keys, Reduction of E-R diagram into tables. Difference between DBMS and RDBMS; Relational Model: Relational Algebra & various operations (set operations, select, project, join, division).

Unit-III Basic SQL Query – Examples of Basic SQL Queries, Introduction to Nested Queries, Correlated Nested Queries Set, Comparison Operators, Agregative Operators, NULL values, Comparison using Null values, Logical connectivity's – AND, OR and NOT. Outer Joins, Complex Integrity Constraints.

SECTION-B

UNIT-IV

Integrity Constraints, Decompositions, Problem related to decomposition, Normalization: FIRST, SECOND, THIRD Normal forms, BCNF, Multi valued Dependencies, forth Normal Form.

UNIT-V

Overview of Transaction Management: ACID Properties, Transactions and Schedules. Execution of Concurrent transactions. Lock Based Concurrency Control, Introduction to Crash recovery: Serializability, and recoverability.

UNIT-VI

Introduction to Distributed Data Processing, Parallel Databases, Data mining & Data Warehousing, Network Model & Hierarchical Model.

Reference Books:

- 1- Fundamentals of Database Systems by R. Elmasri and S.B. Navathe, 3rd edition, 2000, Addison-Wesley, Low Priced Edition.
- 2- Introduction to Database Management System by Satinder Bal Gupta and Aditya Mittal
- 3- An Introduction to Database Systems by C.J. Date, 7th edition, Addison-Wesley, Low Priced Edition, 2000.

DBMS Lab

1. Introduction to SQL.

2. To study Basic SQL commands (create database, create table, use , drop, insert) and execute the following queries using these commands:

- Create a database named ' Employee'.
- Use the database 'Employee' and create a table 'Emp' with attributes 'ename', 'ecity', 'salary', 'enumber', 'eaddress', 'deptname'.
- Create another table 'Company' with attributes 'cname', 'ccity', 'empnumber' in the database 'Employee'.

3. To study the viewing commands (select , update) and execute the following queries using these commands:

- Find the names of all employees who live in Delhi.
- Increase the salary of all employees by Rs. 5,000.
- Find the company names where the number of employees is greater than 10,000.
- Change the Company City to Gurgaon where the Company name is 'TCS'.

4. To study the commands to modify the structure of table (alter, delete) and execute the following queries using these commands:

- Add an attribute named ' Designation' to the table 'Emp'.
- Modify the table 'Emp', Change the datatype of 'salary' attribute to float.
- Drop the attribute 'deptname' from the table 'emp'.
- Delete the entries from the table ' Company' where the number of employees are less than 500.

5. To study the commands that involve compound conditions (and, or, in , not in, between , not between , like , not like) and execute the following queries using these commands:

- Find the names of all employees who live in ' Gurgaon' and whose salary is between Rs. 20,000 and Rs. 30,000.
- Find the names of all employees whose names begin with either letter 'A' or 'B'.
- Find the company names where the company city is 'Delhi' and the number of employees is not between 5000 and 10,000.
- Find the names of all companies that do not end with letter 'A'.

6. To study the aggregate functions (sum, count, max, min, average) and execute the following queries using these commands:

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- Find the sum and average of salaries of all employees in computer science department.
- Find the number of all employees who live in Delhi.
- Find the maximum and the minimum salary in the HR department.

7. To study the grouping commands (group by, order by) and execute the following queries using these commands:

- List all employee names in descending order.
- Find number of employees in each department where number of employees is greater than 5.
- List all the department names where average salary of a department is Rs.10,000.

8. To study the commands involving data constraints and execute the following queries using these commands:

- Alter table 'Emp' and make 'enumber' as the primary key.
- Alter table 'Company' and add the foreign key constraint.
- Add a check constraint in the table 'Emp' such that salary has the value between 0 and Rs.1,00,000.
- Alter table 'Company' and add unique constraint to column cname.
- Add a default constraint to column ccity of table company with the value 'Delhi'.

9. To study the commands for aliasing and renaming and execute the following queries using these commands:

- Rename the name of database to 'Employee1'.
- Rename the name of table 'Emp' to 'Emp1'.
- Change the name of the attribute 'ename' to 'empname'.

10. To study the commands for joins (cross join, inner join, outer join) and execute the following queries using these commands:

- Retrieve the complete record of an employee and its company from both the table using joins.
- List all the employees working in the company 'TCS'.

11. To study the various set operations and execute the following queries using these commands:

- List the number of all employees who live in Delhi and whose company is in Gurgaon or if both conditions are true.
- List the number of all employees who live in Delhi but whose company is not in Gurgaon.

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Annexure 3

CAL-605	PRINCIPAL OF ARTIFICIAL INTELLIGENCE	L	T	P	Cr
		3	1	0	4

OBJECTIVE:

To introduce about artificial intelligence approaches to problem solving, various issues involved and application areas

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT-I

Conventional and AI computing, Definition of AI, History of AI, Strong and weak AI, applications of artificial intelligence, Intelligent agent: Characteristics, types of agent, applications of agents . Problem solving: Defining the problem as states space search, Production system, Problem characteristics, Problem system characteristics.

UNIT-II

Search techniques: BFS, DFS, Uniform cost, Heuristics, Greedy search, Generate and test, Hill climbing, Best first search, A* algorithm, Problem reduction,

UNIT-III

Expert system development life cycle: Expert system: Definition, Role of knowledge in expert system, Architecture of expert system.

Problem selection, Prototype construction, Formalization, Implementation, Evaluation, Knowledge acquisition: Knowledge engineer, Cognitive behavior, Acquisition techniques, Knowledge representation: Level of representation, Knowledge representation schemes, Formal logic, Inference Engine.

SECTION-B

UNIT-IV

Perception: Sensing, Speech recognition, Vision, Neural networks : Introduction, Comparison of artificial neural networks with biological neural networks, Learning in neural networks, Perceptions, Back propagation networks, application of neural networks.

UNIT-V

Fuzzy logic : Definition, Difference between Boolean and Fuzzy logic, fuzzy subset, fuzzy membership function, fuzzy expert system, Inference, process for fuzzy expert system, fuzzy controller.

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Annexure 3

UNIT-VI

Programming in Logic (PROLOG): Introduction, Prolog variables, Using rules, Input and Output predicates, Fail and cut predicates, Recursion, Arithmetic operation, Compound object, Lists, String.

Suggested Readings:

Text Books:

1. David W. Rolston: Principles of Artificial Intelligence and Expert System Development, McGraw Hill Book Company

Reference Books:

1. Elaine Rich, Kevin Knight: Artificial Intelligence, Tata McGraw Hill.
2. Carl Townsend: Introduction to Turbo Prolog, BPB
3. Stamations V. Kartalopoulos: Understanding Neural Networks and Fuzzy Logic, PHI
4. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

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Annexure 3

CAL - 607	Principal Of Software Engineering	L T P	Cr
		4 0 0	4

Objective:

To define software engineering and its importance and to introduce the notion of professional responsibility.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION - A

UNIT – I

Introduction: Software engineering definition and paradigms, A generic view of Software Engineering, Requirements analysis, Statement of system scope, isolation of top level processes and entities and their allocation to physical elements, refinement and review. Analyzing a problem, creating a software specification document, review for correctness, consistency and completeness .Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models,V model.

UNIT – II

Software Requirements analysis & specifications: Requirement engineering, requirement elicitation techniques like FAST, requirements analysis using DFD, Data dictionaries & ER Diagrams, Requirements documentation, Nature of SRS, Characteristics &organization of SRS.

UNIT – III

Software Project Management Concepts: The Management spectrum, The People The Problem, The Process, The Project.

Project Evaluation & Estimation: Cost benefit analysis, cash flow forecasting, cost benefit Evaluation techniques, Cost Estimation Models, COCOMO-I and COCOMO II, Risk Management.

Software Project Planning: Size Estimation like lines of Code &. Albrecht function point analysis.

SECTION - B

UNIT – IV Software Design: Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design, design principal, Strategy.

Software Implementation : Relationship between design and implementation; Implementation issues and programming support environment; Good coding style, and review of correctness and readability.

UNIT – V

Software Testing: Verification & Validation, Testing Process, Design of Test Cases, Objectives of testing, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing.

Software Maintenance: Management of Maintenance, Maintenance Process, need of maintenance, type of maintenance, Reverse Engineering, Software Re-engineering

UNIT-VI

Software Reliability and Quality Assurance :Quality concepts, Software quality assurance , SQA activities; Software reviews: cost impact of software defects, defect amplification and removal, SQA; Statistical software quality assurance; software reliability: Measures of reliability and availability ,The ISO 9000 Quality standards: The ISO approach to quality assurance systems, The ISO 9001 standard, Software Configuration Management. Computer Aided software Engineering: CASE, building blocks, integrated case environments and architecture, repository.

Text Books:

1. Software Engineering **Publisher:** New Age International Pvt Ltd Publishers **Author:** K K Aggarwal, Yogesh Singh **Edition:** Paperback 1st Ed.

Reference books:

1. Fundamentals of software Engineering, Rajib Mall, PHI
2. Software Engineering by Ian Sommerville, Pearson Edu, 5 edition, 1999, AW,
3. Software Engineering – David Gustafson, 2002, T.M.H
4. Software Engineering Fundamentals Oxford University, Ali Behforooz and Frederick J. Hudson 1995 JW&S,
5. An Integrated Approach to software engineering by Pankaj jalote , 1991 Narosa

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Annexure 3

CAL-609	COMPUTER NETWORKS	L	T	P	Cr
		3	1	0	4

OBJECTIVE:

To have a fundamental understanding of the design, performance and state of the art of wireless communication systems, Topics covered include state of the art wireless standards and research and thus changes substantially form one offering of this course to the next

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

UNIT-I

Introduction to computer networks, OSI model, TCP/IP model, Transmission media: guided, & unguided; multiplexing: FDM, TDM, WDM; network topologies: bus, star, ring, hybrid, tree, complete, irregular. Type of network: LAN, MAN, WAN.

UNIT-II

LAN connecting devices: Repeater, Hub, Bridge, Routers, Gateways & their types. Virtual LAN, Frame Relay & ATM Networks.

UNIT-III

Physical Layer: The Physical Layer, Theoretical Basis for Data Communication, Guided Transmission Media, Wireless Transmission, Communication Satellites Digital Signal Encoding Formats – NRZ-L, NRZI, bipolar-AMI, Manchester, Differential Manchester, Digital Modulation – ASK, FSK, PSK, PSK, Digitization – Sampling Theorem, PCM, DM, Analog Modulation – Introducing AM, FM, PM, The Mobile Telephone System.

UNIT – IV

Data Link Control: Framing, Point to Point Protocol, HDLC. Multiple Access: ALOHA, Pure ALOHA, Slotted Aloha, CSMA, CSMA/CD, CSMA/CA. IEEE Standards: 802.3, 802.4, 802.5.

Network Layer: IPv4 frame format & addressing, Classless and classful addressing. Subnetting, Subnetmasks. ARP, RARP, ICMP. Routing: Forwarding, Unicast routing.

SECTION-B

UNIT-V

Transport Layer: User datagram Protocol & Transmission Control Protocol. Congestion Control techniques: Open loop & Closed loop. Quality of Service & their techniques.

Application Layer: Domain Name System; Email – SMTP, POP, IMAP; FTP, HTTP

UNIT-VI

Network Security: Cryptography: Symmetric key & Asymmetric key cryptography Firewalls, VPN, Proxy servers.

TEXT BOOK

Forouzan Behrouz A., “Data Communications and Networking”, 4th Edition, Tata McGraw Hill 2006.

Suggested Raedings:

Text book:

1. Tanenbaum Andrew S, “Computer Networks”, 4th Edition, Pearson Education/Prentice Hall of India, 2003

REFERENCE BOOKS

1. Stallings William, “Data and Computer Communication”, 5th Edition, Prentice Hall of India, 1997.
2. Fred Halsall, “Data Communications, Computer Networks and Open Systems”, 4th edition, Addison Wesley, Low Price Edition, 2000
3. Peterson Larry L. and Davie Bruce S., “Computer Networks – A System Approach”, 3rd Edition, Morgan Kaufmann, 2003.
4. Kurose James F. and Ross Keith W., “Computer Networking: A Top-Down Approach Featuring the Internet”, 2nd Edition, Pearson Education, 2003.
5. Keshav S., “An Engineering Approach to Computer Networking”, Addison-Wesley, 1997.

AHP 601	SOFT SKILLS- 3	L	T	P	Credit
		0	0	2	1

Objective : To improve the personality of the student.

SECTION-A

UNIT-1: INTRODUCTION

- Definition of Personality
- Determinants of Personality- biological, psychological and socio- cultural factors.
- Misconceptions and clarifications
- Need for personality development

UNIT-2: SELF-AWARENESS AND SELF MOTIVATION

- Self analysis through SWOT and Johari window
- Elements of motivation
- Seven rules of motivation
- Techniques and strategies for self motivation
- Motivation checklist and Goal setting based on principle of SMART
- Self motivation and life
- Importance of self-esteem and enhancement of self-esteem.

UNIT-3: MEMORY AND STUDY SKILLS

- Definition and importance of memory
- Causes of forgetting
- How to forget (thought stopping), how to remember (techniques for improving memory)

SECTION-B

UNIT-4: POWER OF POSITIVE THINKING

- Nurturing creativity, decision-making and problem solving.
- Thinking power- seven steps for dealing with doubt
- Traits of positive thinkers and high achievers
- Goals and techniques for positive thinking
- Enhancement of concentration through positive thinking
- Practicing a positive life style.

UNIT-5: GENERAL KNOWLEDGE AND CURRENT AFFAIRS

- Regional, national and international events
- Geographical, political and historical facts
- Information on sports and other recreational activities
- Basic knowledge with regard to health and health promotion

CAS-611 Buzz Session

L-0 T-0 P-2

Credit:1

Objective: A buzz session consists in dividing an audience into small groups to discuss an issue or carry out a task. The groups work simultaneously in the same room (the word buzz comes from the resulting noise).The task is brief and relatively simple.

Syllabus : Specify each group's task. It can be a common one for all groups, or two complementary tasks can be assigned to one-half of the groups respectively or there can be a different task for each group.

Ask participants to introduce themselves to each other before beginning their discussion.
Let groups discuss for no more than 20 minutes. Warn them two minutes before the end.

CAL-602	Advance Computer Architecture (L:3 T:1 P:0)	Credit :4
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Objective : Today is the era of parallel processing in Computer. This subject focuses on the Computer Architecture, pipelined and parallel processor design and algorithms used.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

Unit 1

An Introduction : Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Parallel Computing, Parallel Computer Model, Program and Network Properties, Parallel Architectural Classification Schemes, Flynn's & Fang's Classification, Performance Metrics and Measures, Speedup Performance Laws: Multiprocessor System and Interconnection Networks

Unit 2

Pipelining: Basic and Intermediate Concepts, Instruction Set Principle; ILP: Basics, Exploiting ILP, Limits on ILP; Linear and Nonlinear Pipeline Processors; Super Scalar and Super Pipeline Design;

Unit 3

Memory System Design: The physical memory, models of simple processor memory interaction, processor memory modeling using queuing theory, open, closed and mixed-queue models, waiting time, performance, and buffer size, review and selection of queuing models, processors with cache.

SECTION B

Unit 4

Cache Memory Notion: Basic Notion, Cache Organization, Cache Data, adjusting the data for cache organization, write policies, strategies for line replacement at miss time, Cache Environment, other types of Cache. Split I and D-Caches, on chip caches, Two level Caches, write assembly Cache, Cache references per instruction, technology dependent Cache considerations, virtual to real translation, overlapping the Tcycle in V-R Translation, studies. Design summary.

Unit 5

Multiprocessor Architecture: Taxonomy of parallel architectures; Centralized shared-memory architecture, synchronization, memory consistency, interconnection networks; Distributed shared-memory architecture, Cluster computers.

Unit 6

Concurrent Processors: Vector Processors, Vector Memory, Multiple Issue Machines, Comparing vector and Multiple Issue processors.

Suggested Readings:

Text Book:

Advance computer architecture by Hwang & Briggs, 1993, TMH.

Reference Books:

1. Pipelined and Parallel processor design by Michael J. Fiynn – 1995, Narosa.
2. Computer Organization and Architecture: Designing for performance, W. Stallings, 4th Ed. PHI, 1996.

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Annexure 3

CAL – 604	C# &ASP.NET	L	T	P	Credit
		4	1	2	6

Objective : To learn the .net framework and able to develop applications using .net framework.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

Section-A

Unit-1

The .Net framework: Introduction, The Origin of .Net Technology, Common Language Runtime (CLR), Common Type System (CTS), Common Language Specification (CLS), Microsoft Intermediate Language (MSIL), managed and unmanaged code, Just-In-Time Compilation, Framework Base Classes.

Unit-II

Introduction to C Sharp, main Method, Compilation and Execution, General Structure of C Sharp Program, C# data types, C Sharp Objects, Classes, Objects as Data Type, Creating Classes, Inheritance, Controlling Access to Member of Class, Garbage Collector, Method Overloading.

Unit-III

Concept of Boxing and Unboxing, Collections (Array list, Hash table), Indexer and property, Delegates and events (Multicasting, Multicasting Event), Exception Handling.

Section-B

Unit-IV

ADO.Net & Object Oriented Concepts (Using VB.net or C#) Basic window control, Architecture of ADO.Net, Comparison with ADO, .Net Data provider, Data Adapter, Data Set, Data Row, Data Column, Data Relation, command, Data Reader.

Unit-V

ASP .Net: Anatomy of ASP .NET Page, Server Control: label, buttons, dropdown list box, validation controls, list box, text box, radio button, check box.

Unit-VI

State Management: session caching, Authentication (windows based, Forms Based), Authorization, web services, Advance Grid Manipulation.

Suggested Readings:

Text Books:

1. E. Balguru swami, "Programming in C# :", TMH.

Reference Books:

1. Herbert Schildt : Complete Reference C#, TMH Publication.
2. G. Andrew Duthie : Microsoft ASP .Net With C#. Net step by step, PHI Publication
3. C# 2005 Programming Black Book By dreamtech & Kogent Solution Inc.

.Net Lab

1. Working with call backs and delegates in C#
- 2 Code access security with C#.
- 3 Creating a COM+ component with C#.
- 4 Creating a Windows Service with C#
- 5 Interacting with a Windows Service with C#
- 6 Using Reflection in C#
- 7 Sending Mail and SMTP Mail and C#
- 8 Perform String Manipulation with the String Builder and String Classes and C#:
- 9 Using the System .Net Web Client to Retrieve or Upload Data with C#
- 10 Reading and Writing XML Documents with the XML Text Reader/Writer Class and C#

CAL – 606	COMPUTER GRAPHICS & MULTIMEDIA	L	T	P	Credit
		4	1	2	6

Objective :To be able to utilize skills, technology, and formal concepts to effectively and creatively solve a wide range of graphic design problems which are solved in the context of various multimedia environments.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit 1

An Introduction Graphics System: Computer Graphics and its types, Application of computer graphics, Raster Scan System, Random Scan System, Computer Graphics Hardware and Software, Aliasing and Anti aliasing effects

Unit 2

Output Primitives and Attributes of Output Primitives: 2-D Graphics Primitives: Points and Lines, Line Drawing Algorithm: DDA, Bresenham’s Circle Algorithm: Using Polar coordinates, mid point Circle drawing Algorithm; Filled Area Algorithm: Scanline: Polygon filling algorithm, boundary filled algorithm

Unit 3

Two dimensional Geometric Transformation: Basics Transformations, Matrix Representation and Homogenous Coordinates, Composite Transformations, Reflection and Shearing
Three-Dimensional Transformation: Three Dimensional Graphics Concept, Matrix representation Of 3-D Transformation, Composition of 3-D transformations

SECTION B

Unit 4

Two –Dimension Viewing: The viewing Pipeline, Window to viewport coordinates Transformation, Clipping: Point, clipping line (algorithm):- 4 bit code algorithm, Sutherland-cohen algorithm, parametric line clipping algorithm (Cyrus Beck). **Polygon Clipping algorithm:** Sutherland –Hodgeman polygon clipping algorithm

Unit 5

Viewing in 3D: Projections, types of projections: Parallel Projection and Perspective Projection
Hidden Surface Removal: Introduction to hidden surface removal, The Z-buffer algorithm, Scan line algorithm, area subdivision algorithm

Unit 6

Multimedia: Introduction to Multimedia: Classification Of Multimedia, Multimedia Software, Components of Multimedia-Audio: Analog To Digital conversion, Sound card fundamentals, Audio play backing and recording video, Text: Hypertext, Hypermedia and Hyergraphics, Grahics and Animation, Authoring Process and Tools.

Text Books:

1. Computer Graphics Principles and Practices second edition by James D. Foley, Andeies van Dam, Stevan K. Feiner and Johb F. Hughes, 2000, Addision Wesley.
2. Computer Graphics by Donald Hearn and M.Pauline Baker, 2nd Edition, 1999, PHI
An introduction, Villamil & Molina, Multimedia Mc Milan, 1997

Reference Books:

1. Procedural Elements for Computer Graphics – David F. Rogers, 2001, T.M.H Second Edition
2. Fundamentals of 3Dimensional Computer Graphics by Alan Watt, 1999, Addision Wesley.
3. Computer Graphics: Secrets and Solutions by Corrign John, BPB
4. Graphics, GUI, Games & Multimedia Projects in C by Pilania & Mahendra, Standard Publ.
5. Computer Graphics Secrets and solutions by Corrign John, 1994, BPV
6. Introduction to Computer Graphics By N. Krishanmurthy T.M.H 2002

CG Lab :

A program to draw a line using Digital Differential Analyzer (DDA) Algorithm

A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes negative and less than 1.

A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes positive and less than 1.

A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes positive and greater than 1.

A program to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes negative and greater than 1.

A program to draw a circle using Bresenham's Circle Algorithm.

A program to draw a circle using MidPoint Circle Algorithm

A program to draw a circle using Trigonometric Method.

A program to draw a circle using Polynomial Method.

A program to draw an ellipse using MidPoint Ellipse Algorithm.

A program to draw an ellipse using Trigonometric Method.

A program to draw an ellipse using Polynomial Method.

A program to fill different types of geometric shapes using Flood Fill.Algo.

A program to fill different types of geometric shapes using Boundary Fill Algo.

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Annexure 3

CAL – 608	SYSTEM PROGRAMMING AND COMPILER DESIGN	L	T	P	Credit
		3	1	0	4

Objective : To provide an introduction to the system software like assemblers, compilers, and macros and complete description about inner working of a compiler. The main focus is on the design of compilers and optimization techniques. It also focuses on the design of Compiler writing tools. The course also aims to convey the language specifications, use of regular expressions and context free grammars behind the design of compiler.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

Unit 1

Introduction: System Software Definition, Evolution of Components Systems Programming: Assemblers, Loaders, Linkers, Macros, Compilers, Text editors, Interpreters. **Introduction Compilers:** Compilers and translators need of translators, structure of compiler: its different phases and passes Compiler construction tools.

Unit 2

Lexical Analysis: Introduction, Basic definitions: Lexeme, Token, Pattern, Role of lexical analyzer, design of lexical analyzer, Specification of tokens: regular expressions, examples, recognition of tokens: finite state automata, its type: DFA and NFA, conversion from regular expression to NFA, conversion from NFA to DFA, Minimizing number of states of DFA, A language for specifying Lexical analyzers: LEX source program Specification, Implementation of lexical analyzer.

Unit 3

Syntax Analysis: Introduction, Parser and role in compiler design, context free grammars: notational conventions, example, Derivations and parse trees: process of string derivation, LMD and RMD, parse trees, Ambiguity, process for removal of ambiguity.

Basic Parsing Technique: Parser, Types of Parsers: bottom-up parsing: Shift reduce parser, operator precedence parsing: operator precedence grammar, Leading and Trailing algorithm, constructing operator precedence relation table.

SECTION-B

Unit 4

Top down Parsing: Introduction, top down parsing with backtracking Difficulties with top down parsing with backing, Left recursion, elimination of left recursion, examples, Recursive descent parsing, left factoring, Transition diagrams for recursive descent parser, Predictive parsers: model of predictive parser, algorithm for computing first and follow, Construction of parsing tables, LL(1) grammars and its properties.

Unit 5

Automatic Construction of efficient Parsers: LR parsers: architecture of LR parsers, LR parsing algorithm Types of parsers, the canonical Collection of LR(0) items, item sets ,algorithm for constructing LR(0) items, constructing SLR parsing tables, conflict in SLR(1),constructing Canonical LR parsing tables, LR(1) grammar, constructing LALR sets of items, Constructing LALR parsing tables, LALR(1) grammars, Comparison of LR parsers ,an automatic parser generator: YACC.

Unit 6

Syntax Directed Translations: Syntax directed definition, construction of syntax trees, syntax directed translation scheme, implementation of syntax directed translation,

Intermediate code generation: Introduction, three address code, quadruples and triples. Overview of Code optimization and Error recovery.

Suggested Readings:

Text books:

1. Donovan J. John, System Programming, Tata McGraw Hill.
2. Alfred V Aho and Jeffery D Ullman, Principles of Compiler Design, Narosa/Addison Wesley.
3. Dhamdhere D.M, System programming and operating system, (Tata Mc-Graw-Hill).

Reference Books:

1. Aho, Sethi, & Ullman, Compilers Principles, Techniques and Tools, AddisonWesley.
2. Jean Paul Tremblay and Sorenson, The Theory and Practice of Compiler Writing, McGraw Hill.

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Annexure 3

Elective – 3 CAL-614	E-Commerce	L	T	P	Credit
		4	0	0	4

Objective : Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges and to be able to apply concepts of e-Commerce

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION-A

Unit-I

Introduction of E-Commerce: Emerging role of e-commerce, Definition of E-Commerce, scope of e-commerce-business and e- commerce transaction, impact of e-commerce, merits and demerits of e-commerce, classification of e- commerce.

Unit-II

Business to Business & Business to Consumer:

Business to Business :Roles and challenges in business to business e – commerce, The supplier’s perspective, A variety of selling channels, why item no & price aren’t enough, basic supplier challenges.

Business to Consumer: introduction, e-commerce information system architecture, principal problem with e- commerce information system.

Unit-III

Electronic Payment Technologies and Systems:

Technology Issues: Electronic payment technology issues: online payment processing basics, the payment processing network, how payment processing works.

Electronic Payment Systems: What is electronic payment system; Types of electronic payment system, Digital token based electronic payment systems, electronic payment media: National fund transfer types, trusted third party type , digital cash, examples based on electronic payment media.

SECTION-B

Unit-IV

Mobile E-Commerce and agents in E- Commerce: What is mobile e- commerce , dimensions of mobile computing, benefits of mobile e- commerce , mobile communication framework.

Agents: Need for agents, importance and categories of agents, types of agents, Agent’s technologies, agent standards and protocols, applications.

Unit-V

Designing and building E-Commerce websites: Introduction, The website: features and advantages, application of life cycle for design and development of website, website creation /development, website navigation design, the criteria of web design.

Unit-VI

Securing Network Transaction in E – Commerce:

Legal and ethical issues of E-Commerce: introduction, ethical issues, legal issues, taxation issues, cyber jurisdiction, web linking and domain name disputes.

Web security aspects in E- Commerce: E- Commerce security issues, web security: introduction, types of web security risks, precautions in web security. **Client Server technology:** Overview of it technology, benefits, concerns, client server network security.

Firewall network security: importance, firewall protection, limitation, types of firewall.

Suggested Readings:

Text Books:

1. Stoner, Freeman, Gilbert: Management, Latest, PHI Publication.

Reference Books:

1. Kenneth C. Laudon, Jane P. Laudon: Management Information System, Latest Edition, Pearson Education Publication.
2. P.T. Joseph: E-Commerce - A Managerial Perspective, PHI Publication.
3. Jeffery: Introduction to E-Commerce, TMH.
4. Any other book(s) covering the contents of the paper in more depth.

Note: Latest and additional good books may be suggested and added from time to time.

1. Murty, C.V.S., E-Commerce, Himalaya Publications, New Delhi
2. Kienam, Managing Your E-Commerce business, Prentice Hall of India, N.Delhi.
3. Kosiur, Understanding E-Commerce, Prentice Hall of India, N.Delhi.
4. Kalakota, Whinston , Frontiers of Electronic Commerce, Addison Wesley.

Elective – 3 CAL-616	Management Information System	L	T	P	Credit
		4	0	0	4

Objective : Identify the major management challenges to building and using information systems and learn how to find appropriate solutions to those challenges and to be able to apply concepts of information technology.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

Section A

Unit 1:

Introduction to systems and Basic systems concepts, Types of systems, The systems Approach, Information systems: Definition and characteristics, types of Information, role of Information in

Unit 2: Decision – Making, Sub – systems of information systems: EDP and MIS, management levels, EDP/MIS/DSS

Unit 3: An overview of Management Information System: Definition and Characteristics, Components of MIS, Frame Work understanding MIS: Robert Anthony’s Hierarchy of Management Activity.

Section B

Unit 4: Information requirements and Levels of Management, Simon’s Model of decision – Making, structured Vs un-structured decisions, Formal Vs. Information systems

Unit 5: Developing Information systems: Analysis and design of information systems: Implementation and evaluation, Pitfalls in MIS development.

Unit 6: Functional MIS: A study of Marketing, Personnel, financial and Production MIS

References:

1. J. Kanter,” Management Information Systems”, PHL.
2. Goirden B. Davis & M.H.Olsca “ Management Information Systems: Conceptual Foundation, Structure and Development:
3. Robert G. Murdick & Joel E. Ross & James R. Claggett, “ Information Systems for Modern Management”, PHI.
4. Lucas, “analysis, Design & Implementation of Information system”.

AHP602	SOFT SKILLS- 4	L	T	P	Credit
		0	0	2	1

Objective : To improve the personality of the students.

SECTION-A

UNIT-1: STRESS MANAGEMENT

- Definitions and manifestations of stress
- Stress coping ability and stress inoculation training
- Management of various forms of fear (examination fear, stage fear or public speaking anxiety, depression and anger
- Dealing with crisis and disasters

UNIT-2: SOCIAL SKILLS AND CONFLICT MANAGEMENT SKILLS

- Component of Social Skills, effective ways of dealing with people.
- Types of conflict (intrapersonal, intra group and inter group conflicts)
- Basic concepts, cues, signals, symbols and secrets of body language
- Significance of body language in communication and assertiveness training
- Conflict stimulation and conflict resolution techniques for effective conflict management

UNIT-3: INTER-PERSONAL SKILLS

- Concept of team in work situation, promotion of team sprit, characteristics of team player.
- Awareness of ones own leadership style and performance.
- Nurturing leadership qualities.
- Emotional intelligence and leadership effectiveness- self awareness, self management, self motivation, empathy and social skills
- Negotiation skills- preparation and planning, definition of ground rules, clarification and justification, bargaining and problem solving, closure and implementation

SECTION-B

UNIT-4: TIME MANAGEMENT

- Time wasters- Procrastination
- Time management personality profile
- Time management tips and strategies
- Advantages of time management

UNIT-5: INTERVIEW SKILLS

- Professional Grooming and Hygiene
- Prevention of moral dwarfism – Moral and social code of conduct, ethics and other values.
- Tone, Gestures and Body Language
- Frequently asked questions
- Prevention of moral dwarfism – Moral and social code of conduct, ethics and other values, social concerns.

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Annexure 3

CAS-612 Powwow L-0 T-0 P-2 Credit:1

Objective: To train the students using debate.

Syllabus:

In every session topic should be allocated to students. Initially 10 minutes of time should be given for thinking and then students are allowed to discuss their idea. It is similar to debate .

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Annexure 3

AHP-602	SOFT SKILLS – 4	L	T	P	Credit
		0	0	2	1

(Common for MCA and Integrated MCA)

SECTION-A

UNIT-1: STRESS MANAGEMENT

- Definitions and manifestations of stress
- Stress coping ability and stress inoculation training
- Management of various forms of fear (examination fear, stage fear or public speaking anxiety, depression and anger
- Dealing with crisis and disasters

UNIT-2: SOCIAL SKILLS AND CONFLICT MANAGEMENT SKILLS

- Component of Social Skills, effective ways of dealing with people.
- Types of conflict (intrapersonal, intra group and inter group conflicts)
- Basic concepts, cues, signals, symbols and secrets of body language
- Significance of body language in communication and assertiveness training
- Conflict stimulation and conflict resolution techniques for effective conflict management

UNIT-3: INTER-PERSONAL SKILLS

- Concept of team in work situation, promotion of team sprit, characteristics of team player.
- Awareness of ones own leadership style and performance.
- Nurturing leadership qualities.
- Emotional intelligence and leadership effectiveness- self awareness, self management, self motivation, empathy and social skills
- Negotiation skills- preparation and planning, definition of ground rules, clarification and justification, bargaining and problem solving, closure and implementation

SECTION-B

UNIT-4: TIME MANAGEMENT

- Time wasters- Procrastination
- Time management personality profile
- Time management tips and strategies
- Advantages of time management

UNIT-5: INTERVIEW SKILLS

- Professional Grooming and Hygiene
- Prevention of moral dwarfism – Moral and social code of conduct, ethics and other values.
- Tone, Gestures and Body Language
- Frequently asked questions
- Prevention of moral dwarfism – Moral and social code of conduct, ethics and other values, social concerns

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Annexure 3

MCA-V sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Advanced Java Technology	CAL – 701	4	1	2	7	6
2	Analysis and Design of Algorithms	CAL – 703	4	1	2	7	6
3	Dataware house and data mining	CAL – 705	4	0	0	4	4
4	Network Security	CAL – 707	4	0	0	4	4
5	Elective - 4		4	0	0	4	4
6	Soft Skills-V	AHP-701	0	0	2	2	1
7	Clambake	CAS – 709	0	0	2	2	1
Total			20	2	8	30	26
S. No.	Elective -4	Code	L	T	P	Total Hrs	Credit
1	Distributed Operating System	CAL-711	4	0	0	4	4
2	Software Project Management	CAL-713	4	0	0	4	4
MCA-VI sem / Integrated (BCA+MCA)							
S. No.	Name of the Paper	Code	L	T	P	Total Hrs	Credit
1	Major Project	CAP-702	0	0	20	20	10

CAL-701	Advance Java Technology	L	T	P	Cr
		4	1	2	6

Objective

This course of Advance JAVA provides knowledge about JDBC, Servlets, Java server pages, Beans, Frameworks, and J2EE technologies.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit I

Introduction to Java: Data types, variables, operators, Arrays, Control Statements, Classes & Methods, Inheritance, Exception Handling, Multithreading, Collections, I/O streams, AWT & Applet Programming.

Unit II

NETWORKING

Connecting to a Server, Implementing Servers, Sending E-Mail, Making URL Connections, AdvancedSocketProgramming.

Unit III

Advance JDBC Programming: Introduction to JDBC, JDBC Drivers & Architecture, Connecting to non-conventional Databases. Using SQL, dealing with Database Metadata.

SECTION B

Unit IV

Introduction to Servlet: Need for dynamic content, java Servlet technology, why Servlet? **Servlet API and Lifecycle:** Servlet life cycle, Developing and Deploying Servlet ,Servlet API, servletConfig interface, ServletRequest and ServletResponse Interfaces

Unit V

Java Server Pages Technology: Basic JSP Architecture, Life Cycle of JSP (Translation, compilation),JSP Tags and Expressions, Role of JSP in MVC, JSP Implicit Objects,Tag Libraries,JSP Expression Language (EL),Using Custom Tag,

Unit VI

RMI (Remote Method Invocation): RMI overview, RMI architecture, Example demonstrating RMI.

Enterprise JAVA Beans: Enterprise Bean overview, Types of enterprise beans, Advantages of enterprise beans, The Life Cycles of Enterprise Beans, Working with Session Beans.

Suggested Readings:

Text Books:

1. J2EE Complete Reference

Reference Books:

1. Struts 2 in Action by Donald Brown, Davis, Stanlick.
2. Struts 2 Design and Programming: A Tutorial by Budi Kurniawan.
3. Core servlets and Java Server Pages: Volume 2, Advanced Technology by Marry Hall, Larry Brown, ChaiKin.
4. Core J2EE Patterns: Best Practices and Design Strategies by Deepak Alur, Dan Malks, John Crupi.

List Of Experiments:

Some Programs should be developed on the following topics:

1. WAP to demonstrate the use of JDBC.
2. WAP to demonstrate the use of servlet
3. WAP to demonstrate JSP
4. WAP to demonstrate the RMI

CAL-703	Analysis and Design of Algorithms	L	T	P	Cr
		4	1	2	6

Objective

This course introduces students to the analysis and design of computer algorithms and to apply important algorithmic design paradigms and methods of analysis.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit 1:

Introduction: Algorithm, Psuedocode for expressing algorithms, Performance Analysis-Space complexity, Time complexity, Asymptotic Notation- Big oh notation, Omega notation, Theta notation and Little oh notation, Probabilistic analysis, Amortized analysis.

Unit 2 :

Divide and conquer: General method, applications-Binary search, Quick sort, Merge sort, Strassen's matrix multiplication.

Unit 3 :

Greedy method: General method, applications-Job sequencing with dead lines, 0/1 knapsack problem, Minimum cost spanning trees, Single source shortest path problem.

SECTION B

Unit 4

Dynamic Programming: General method, applications-Matrix chain multiplication, Optimal binary search trees, 0/1 knapsack problem, All pairs shortest path problem, Travelling sales person problem, Reliability design.

Unit 5 :

Backtracking: General method, applications-n-queen problem, sum of subsets problem, graph coloring, Hamiltonian cycles.

Unit 6 :

Branch and Bound: General method, applications - Travelling sales person problem, 0/1 knapsack problem- LC Branch and Bound solution, FIFO Branch and Bound solution. Basic concepts about NP-Hard and NP-Complete problems.

Text Books:

1. Fundamentals of Computer Algorithms, Ellis Horowitz, Satraj Sahni and Rajasekharam, Galgotia publications pvt. Ltd.
2. Design and Analysis Algorithms - Parag Himanshu Dave, Himanshu Bhalchandra Dave Publisher: Pearson
3. Algorithm Design: Foundations, Analysis and Internet examples, M.T. Goodrich and R. Tomassia, John Wiley and sons.

Reference Books:

1. Introduction to Algorithms, second edition, T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein, PHIPvt. Ltd./Pearson Education
2. Introduction to Design and Analysis of Algorithms A strategic approach, R.C.T. Lee, S.S. Tseng, R.C. Chang and T. Tsai, McGraw Hill.
3. Data structures and Algorithm Analysis in C++, Allen Weiss, Second edition, Pearson education.
4. Design and Analysis of algorithms, Aho, Ullman and Hopcroft, Pearson education.

List Of Experiments:

1. Sort a given set of elements using the Quick sort method and determine the time required to sort the elements.
2. Sort a given set of elements using the Merge sort method and determine the time required to sort the elements.
3. Search given element using Binary search and determine the time required to search the element.
4. Implement 0/1 Knapsack problem .
5. Implement N Queen's problem using Back Tracking.
6. Implement All Pairs Shortest Paths Problem using Floyd' algorithm.
7. Implement Minimum Cost Spanning Tree of a given undirected graph.

CAL-705	Data Warehousing and Data Mining	L	T	P	Cr
		4	0	0	4

Objective

Students will be enabled to understand and implement classical models and algorithms in data warehousing and data mining. They will learn how to analyze the data, identify the problems, and choose the relevant models and algorithms to apply.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit-1: Data warehousing Definition, usage and trends. DBMS vs data warehouse, Data marts, Metadata, Multidimensional data mode, Data cubes, Schemas for Multidimensional Database: stars, snowflakes and fact constellations.

Unit-2: Data warehouse process & architecture, OLTP vs OLAP, ROLAP vs MOLAP, types of OLAP, servers, 3-Tier data warehouse architecture, distributed and virtual data warehouses, data warehouse manager.

Unit-3: Data warehouse implementation, computation of data cubes, modeling OLAP data, OLAP queries manager, data warehouse back end tools, complex aggregation at multiple granularities, tuning and testing of data warehouse.

SECTION B

Unit-4: Data mining definition & task, KDD versus data mining, data mining techniques, tools and applications.

Unit-5: Data mining query languages, data specification, specifying knowledge, hierarchy specification, pattern presentation & visualization specification, data mining languages and standardization of data mining.

Unit-6: Data mining techniques: Association rules, Clustering techniques, Decision tree knowledge discovery through Neural Networks & Genetic Algorithm, Rough Sets, Support Vector Machines and Fuzzy techniques.

Text Books:

1. Data Warehousing In the Real World; Sam Anahory & Dennis Murray; 1997, Pearson

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2. Data Mining- Concepts & Techniques; Jiawei Han & Micheline Kamber- 2001, Morgan Kaufmann.
3. Data Mining Techniques; Arun Pujar; 2001, University Press; Hyderabad.

Reference Books:

1. Data Mining; Pieter Adriaans & Dolf Zantinge; 1997, Pearson,
2. Data Warehousing, Data Mining and OLTP; Alex Berson, 1997, Mc Graw Hill.
3. Data warehousing System; Mallach; 2000, Mc Graw Hill.
4. Building the Data Warehouse; W.H. Inman, 1996, John Wiley & Sons.
5. Developing the Data Warehouses; W.H Ionhman,C.Klelly, John Wiley & Sons.
6. Managing the Data Warehouses; W.H.Inman, C.L.Gassey, John Wiley & Sons. .

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CAL-707	Network Security	L	T	P	Cr
		4	0	0	4

Objective

The aim of this course is to provide students with a thorough understanding of the issues associated with the design, provision and management of security services for modern communication and information systems.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit 1:

Security Attacks (Interruption, Interception, Modification and Fabrication), Security Services (Confidentiality, Authentication, Integrity, Non-repudiation, access Control and Availability) and Mechanisms, Buffer overflow & format string vulnerabilities, TCP session hijacking, ARP attacks, route table modification, UDP hijacking, and man-in-the-middle attacks.

Unit 2 :

Conventional Encryption Principles, Conventional encryption algorithms, cipher block modes of operation, location of encryption devices, key distribution Approaches of Message Authentication, Secure Hash Functions and HMAC

Unit 3 :

Public key Cryptography: Algorithms, examples, Modular arithmetic (addition,multiplication, inverse, and exponentiation) RSA: generating keys, encryption and decryption. Other Algorithms: PKCS, Diffie-Hellman, El Gamal signatures, DSS, Zero knowledge signatures.

SECTION B

Unit 4

Authentication: Password Based, Address Based, Cryptographic Authentication. Passwords in distributed systems, online vs. offline guessing, storing. Cryptographic Authentication: passwords as keys, protocols, KDC's Certification Revocation, Inter domain, groups, delegation. Authentication of People: Verification techniques, passwords, length of passwords, password distribution, smart cards, biometrics.

Unit 5 :

IP Security Overview, IP Security Architecture, Authentication Header, Encapsulating Security Payload, Combining Security Associations and Key Management.

Unit 6 :

Firewall Design principles, Trusted Systems. Intrusion Detection Systems

Text Books:

1. Network Security Essentials (Applications and Standards) by William Stallings Pearson Education.
2. Hack Proofing your network by Ryan Russell, Dan Kaminsky, Rain Forest Puppy, Joe Grand, David Ahmad, Hal Flynn Ido Dubrawsky, Steve W.Manzuik and Ryan Permech, Wiley Dreamtech

Reference Books:

1. Network Security and Cryptography: Bernard Menezes, CENGAGE Learning.
2. Network Security - Private Communication in a Public World by Charlie Kaufman, Radia Perlman and Mike Speciner, Pearson/PHI.
3. Cryptography and network Security, Third edition, Stallings, PHI/Pearson
4. Principles of Information Security, Whitman, Cengage Learning.

CAL-711	Distributed Operating System	L	T	P	Cr
		4	0	0	4

Objective

This course provides an in-depth examination of the principles of distributed systems in general, and distributed operating systems in particular. It covers advanced topics in concurrency, deadlock protection, multiprocessor scheduling, computer system modeling, and virtual memory management from the operating systems viewpoint.

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

SECTION A

Unit 1:

Introduction: Introduction to distributed system, Goals Of distributed System, Principles of distributed systems Hardware and Software Concepts, Design Issues.

Unit 2 :

Communication in distributed system: Layered protocols, ATM networks, Client – Server model, Remote Procedure Calls and Group Communication. Middleware and Distributed Operating Systems

Unit 3 :

Synchronization in Distributed System: Clock synchronization, Mutual Exclusion, Election algorithm, the Bully algorithm, a Ring algorithm, Atomic Transactions, Deadlock in Distributed System, Distributed Deadlock Prevention, Distributed Deadlock Detection.

SECTION B

Unit 4 :

Processes and Processors in distributed systems:Threads, System models, Processors Allocation, Scheduling in Distributed System, Real Time Distributed Systems.

Unit 5 :

Distributed Shared Memory: What is shared memory, Consistency models, Page based distributed shared memory, shared variables distributed shared memory.

Unit 6 :

Case study MACH: Introduction to MACH, process management in MACH, communication in MACH, UNIX emulation in MACH.

Text Books:

1. Distributed Operating System – Andrew S. Tanenbaum, PHI.

Reference Books:

1. Operating Systems’ – Internal and Design Principles Stallings, Fifth Edition–2005, Pearson education/PHI.
2. Modern Operating Systems, Andrew S Tanenbaum 2nd edition Pearson/PHI.

CAL-713	Software Project Management	L	T	P	Cr
		4	0	0	4

Objective : Software Project Management plays important role in successful software projects completion. Together with software techniques it can produce software of high quality. This course aims to cover the basics

- Deliver successful software projects that support organization's strategic goals
- Match organizational needs to the most effective software development model
- Plan and manage projects at each stage of the software development life cycle (SDLC)
- Create project plans that address real-world management challenges
- Develop the skills for tracking and controlling software deliverables

Note :For setting up the question paper, question no 1 will be set up from complete syllabus which will be compulsory and of short answer type. Three questions will be set from each of the sections. The students have to attempt first common question, which is compulsory, and two question from each of the sections. Thus students will have to attempt 5 questions out of 7 questions.

Section A

Unit 1

Product: The evolving role of software-an industry perspective-aging software plant-software competitiveness. Software - characteristics-components-application-crisis on the horizon-software myths.

Unit 2

Process: Process-methods-tools-a generic view of software Engineering-software process models-linear sequential model- proto typing model- RAD model- incremental, spiral, component, assembly and concurrent development models. Project Management concept: People – Product-Process-Project

Unit 3

Software process and project metrics: - Measures- Metrics and indicators- Software measurements- metrics for software quality- integrating metrics within the software process.

Section B

Unit 4

Software project planning: Planning objectives - software scope-resources-software project estimation-Decomposition Techniques –Empirical estimation models-COCOMO model-automated estimation tools. Risk management: software risks-risk identification-risk projection-risk mitigation, monitoring and management-safety risks and hazards-RMMM plan.

Unit 5

Project scheduling and tracking: Basic concepts-relation between people and effort- defining task set for the software project-selecting software engineering task-refinement of major task-defining a task network-scheduling-project plan.

Unit 6

Software quality assurance-quality concepts-software reviews-formal technical review-Formal approaches to SQA- software reliability-SQA plan-the ISO 9000 quality standards. Software configuration management: baselines-software configuration item-the SCM process identification of objects in software configuration-version control-change control- configuration audit-status reporting-SCM standards.

Text Book :

1.Walker Royce, Software Project management: A unified framework , Pearson Education

Reference:

- 1.Pankaj Jalote., Software Project management in practice, Pearson Education
- 2.Kelkar, S.A., Software Project management: A concise study, PHI
- 3.Mike Cottorell and Bob Hughes , Software Project management –
- 4.Sommerville I , Software engineering –, Addison Wesley
- 5.Robert Futrell, Donald F Shafer and Linda I Quality software project management , Person Education
- 6.Pressman ,R.S., Software Engineering, McGraw Hill International

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CAS-709	ClamBake	(0-0-2)	Credit: 1
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Objective: To train the students through seminar and presentation.

Some technical topic / research papers should be given to students under supervision of a teacher and the students are supposed to prepare for the presentation and present the topic. A report in standard format will be submitted in the department.

AHP-701	SOFT SKILLS – 5	L	T	P	Credit
		0	0	2	1

(Common for MCA and Integrated MCA)

Objective: This syllabus aims to develop full fleshed professional skills in the personality of a professional.

Unit 1: English at different place

- Communicating in various situations and making inquires at different places like post office, bank, airport, Hospitals etc.
- Filling up of Bank Pay in Slip, Ration Card Application Forms, and Passport Forms etc.
- Advertisement and write an application
- Preparing for an interview Responding to questions

Unit 2: Becoming a Professional

- Group discussion
- Lesson from successful / greatest figurers' life
- Explaining aim in life
- Importance of Time Management
- Responsibility toward a better future
- Training Games
- Role Play

Unit 3: Development of Organizing and implementation of exercises/task

- Systematic approach
- Accuracy
- Efficient work
- Carefulness
- Planning & Organizing

Unit 4: Development of Mental Techniques

- Risk taking skill
- Managing challenges
- Ability to draw analogies
- Thinking ahead
- Ability to transfer Creativity

Unit 5: Development of independency and responsibility

- Ability to make judgment
- Reliability
- Holding an opinion
- Awareness of quality

Unit 6: Development of occupational Competency

- Leadership skills
- Problem solving skills
- Organising and Co-ordination skills
- Critical thinkings
- Decission Making