

**BACHELOR OF COMPUTER APPLICATIONS (BCA)****SEMESTER FIRST**

SR. NO.	SUB_CODE	SUBJECT_TITLE	L	T	P	CR.	HRS.
1	MA001	Founadation Course in Mathematics - I	3	1	0	3.5	4
2	CA001	Computer Organization and Architecture	3	1	0	3.5	4
3	CA003	Problem Solving and Programming in C	3	0	4	5	7
4	CA002	Fundamental of Information Technology	3	0	4	5	7
5	HU004	Personality Development and Communication Skills-I	3	1	0	3.5	4
			<b>15</b>	<b>3</b>	<b>8</b>	<b>21</b>	<b>26</b>

**SEMESTER SECOND**

SR. NO.	SUB_CODE	SUBJECT_TITLE	L	T	P	CR.	HRS.
1	MA002	Founadation Course in Mathematics - II	3	1	0	3.5	4
2	CA045	Digital Electronics	3	1	0	3.5	4
3	CA004	Data and File Structure	3	0	3	4.5	6
4	CA010	System Analysis and Design	3	1	0	3.5	4
5	HU006	Personality Development and Communication Skills-II	3	1	0	3.5	4
6	CA005	Database Management System	3	0	3	4.5	6
			<b>18</b>	<b>4</b>	<b>6</b>	<b>23</b>	<b>28</b>

**SEMESTER THIRD**

SR. NO.	SUB_CODE	SUBJECT_TITLE	L	T	P	CR.	HRS.
1	MA003	Discrete Mathematics	3	1	0	3.5	4
2	CA007	Operating System	3	0	2	4	5
3	CA014	Internet Concepts and Web Design	3	0	3	4.5	6
4	CA006	Object Oriented Programming with C++	3	0	3	4.5	6
5	BM081	Business Organization and Management	3	1	0	3.5	4
6	CA040	Management Information System	3	1	0	3.5	4
			<b>18</b>	<b>3</b>	<b>8</b>	<b>23.5</b>	<b>29</b>

**SEMESTER FOURTH**

SR. NO.	SUB_CODE	SUBJECT_TITLE	L	T	P	CR.	HRS.
1	BM082	Accountancy and Financial Management	3	1	0	3.5	4
2	CA030	Visual Basic Programming	3	0	3	4.5	6
3	CA013	Computer Networks	3	0	2	4	5
4	MA004	Statistical and Numerical Computing	3	1	2	4.5	6
5	CA046	Core Java	3	0	3	4.5	6
			<b>15</b>	<b>2</b>	<b>10</b>	<b>21</b>	<b>27</b>

**SEMESTER FIFTH**

SR. NO.	SUB_CODE	SUBJECT_TITLE	L	T	P	CR.	HRS.
1	CA037	.Net Programming	3	0	4	5	7
2	MA005	Operation Research	3	1	2	4.5	6
3	HU002	Business Economics	3	1	0	3.5	4
4	CA015	Computer Graphics and Multimedia	3	0	2	4	5
5	CA016	Mobile Computing	3	0	3	4.5	6
			<b>15</b>	<b>2</b>	<b>11</b>	<b>21.5</b>	<b>28</b>

**SEMESTER SIXTH**

<b>SR. NO.</b>	<b>SUB_CODE</b>	<b>SUBJECT_TITLE</b>	<b>L</b>	<b>T</b>	<b>P</b>	<b>CR.</b>	<b>HRS.</b>
1	EN001	Environmental Studies	3	1	0	3.5	4
2	CA017	Software Engineering	3	1	0	3.5	4
3		Elective - I	3	1	0	3.5	4
4		Elective - II	3	0	2	4	5
5	PB002	Project	0	0	12	6	12
			<b>12</b>	<b>3</b>	<b>14</b>	<b>20.5</b>	<b>29</b>

**ELECTIVE - I (Any One)**

1	CA019	Basics of Design and Analysis of Algorithms	3	1	0	3.5	4
2	CA020	Computer Network Security	3	1	0	3.5	4
3	CA018	Artificial Intelligence and Applications	3	0	2	4	5

**ELECTIVE - II (Any One)**

1	CA021	E-Commerce	3	0	2	4	5
2	CA022	Internet Programming	3	0	2	4	5
3	CA036	Software Testing and Quality Management	3	1	0	3.5	4

## MA001: FOUNDATION COURSE IN MATHEMATICS-I

L	T	P	Cr
3	1	0	3.5

**DETERMINANTS:** Definition, Minors, Cofactors, Properties of Determinants

**MATRICES:** Definition, Types of Matrices, Addition, Subtraction, Scalar Multiplication and

Multiplication of Matrices, Adjoint, Inverse, Cramers Rule, Rank of Matrix Dependence of Vectors, Eigen Vectors of a Matrix, Caley-Hamilton Theorem (without proof)

[No. of Hrs: 11]

**LIMITS & CONTINUITY:** Limit at a Point, Properties of Limit, Computation of Limits of Various Types of Functions, Continuity at a Point, Continuity Over an Interval, Intermediate Value Theorem, Type of Discontinuities

[No. of Hrs: 11]

**DIFFERENTIATION:** Derivative, Derivatives of Sum, Differences, Product & Quotients, Chain Rule, Derivatives of Composite Functions, Logarithmic Differentiation, Rolle's Theorem, Mean Value Theorem, Expansion of Functions (Maclaurin's & Taylor's), Indeterminate Forms, L' Hospitals Rule, Maxima & Minima, Concavity, Asymptote, Singular Points, Curve Tracing, Successive Differentiation & Liebnitz Theorem.

[No. of Hrs: 11]

**INTEGRATION:** Integral as Limit of Sum, Riemann Sum, Fundamental Theorem of Calculus, indefinite Integrals, Methods of Integration Substitution, By Parts, Partial Fractions, Integration of Algebraic and Transcendental Functions, Reduction Formulae for Trigonometric Functions, Gamma and Beta Functions.

**VECTOR ALGEBRA:** Definition of a vector in 2 and 3 Dimensions; Double and Triple Scalar and Vector Product and their Applications.

[No. of Hrs: 11]

**Text Books:**

1. Kresyig E., "Advanced Engineering Mathematics", 5th Edition, John Wiley & Sons,

**Reference Books:**

1. B.S. Grewal, "Elementary Engineering Mathematics",.
2. H.K. Dass, "Advanced Engineering Mathematics", S. Chand & Company,
3. Shanti Narayan, "Integral Calculus", S. Chand & Company,
4. Shanti Narayan, "Differential Calculus", S.Chand & Company,

## CA001: COMPUTER ORGANISATION AND ARCHITECTURE

L	T	P	Cr
3	1	0	3.5

**Basic Computer Organization** Principles of Computer design - Software, hardware interaction layers in computer architecture. Central processing unit. Machine language instructions, Addressing modes, instruction types, Instruction set selection, Instruction cycle and execution cycle.

**Control Unit and Arithmetic Unit:** ALU, data path design, control path design, hardwired control, micro programmed control, micro programming control Vs hardwired control, RISC Vs CISC, hardware implementation of algorithms for addition, subtraction, multiplication and division.

**Pipeline:** Parallel processing, pipeline general consideration, arithmetic pipeline, instruction pipeline, complexities in pipeline, super scalar processing.

**Memory System:** Memory, memory hierarchy, main memory, associative memory, cache memory, virtual memory, architectural tools to implement these different memories.

**Input Output Organization:** Input & output interface, asynchronous data transfer, Modes of transfer, DMA, I/O interrupts, channels.

**Secondary Storage Techniques:** Secondary Storage Systems; Hard Drives Removable Drives Removable Storage Options- Zip, Jaz & Other Cartridge Drives, Recordable CDs & DVDs, CD-R vs CD-RW, Tape Backup

**I/O Technology:** Keyboard ; Mouse; Video Cards; Monitors ; Liquid Crystal Displays (LCD) ; Digital Camera ; Sound Cards; Printers ; Modems; Scanners; Power Supply- SMPS (Switched Mode Power Supply)

**Performance evaluation** - SPEC marks, Transaction Processing benchmarks.

### **Text Books:-**

1. *Mano, Morris M., Computer System Architecture, Dorling Kindersley*
2. *Hayes, J.P., Computer Architecture and Organization, McGraw Hill*

### **Reference Books:-**

- 1 *Patterson, David, A., Hennessy, J.L., and Arpacidusseau, A.C., Computer Architecture – A Quantitative Approach, Morgan Kaufmann Publishers,*
- 2 *Stallings, W., Computer Organization and Architecture: Designing for Performance, PHI*

## CA002: FUNDAMENTALS OF INFORMATION TECHNOLOGY

L	T	P	Cr
3	0	4	5

**Computer Organisation:** What are computers? The evolution of computers, Classification of computers. [No. of Hrs: 10]  
Block Diagram: Input-output devices, Description of Computer Input Units, Other Input Methods, and Computer Output Units. Computer Memory: Memory Cell, Memory Organization, Read Only Memory, Serial Access Memory, Physical Devices Used to construct Memories, Magnetic Hard disk, floppy Disk Drives, Compact Disk Read Only Memory, Magnetic Tape Drives.

Low level and high level languages, assemblers, compilers, interpreters, linkers, algorithms, flow charting, decision tables, pseudo code, software software concepts: system & application software packages.

**Computer Generation & Classifications:** First Generation of Computers, The Second Generation, The third [No. of Hrs: 10]  
Generation, The fourth Generation, The Fifth Generation, Classification of Computers, Distributed Computer System, Parallel Computers.

**Operating System concepts,** different types of operating systems, structure of operating system, [No. of Hrs: 12]  
DOS/UNIX/LINUX commands, working with Windows, Windows 9x/NT/XP, Data Processing, File Systems and Database Management Systems, different types of Database Management System

**Basic elements of a communication system,** Data transmission modes, Data Transmission speed, Data [No. of Hrs: 12]  
transmission media, Digital and Analog Transmission, Network topologies, Network Types (LAN, WAN and MAN), OSI & TCP/IP Model, Internet: Network, Client and Servers, Host & Terminals, TCP/IP, World Wide Web, Hypertext, Uniform Resource Locator, Web Browsers, IP Address, Domain Name, Internet Services Providers, Internet Security, Internet Requirements, Web Search Engine, Net Surfing, Internet Services, Intranet.

### **Text Books:-**

- 1 Alex Leon & Mathews Leon, "Fundamentals of Information Technology", Leon Techworld,
- 2 Vikas Gupta, "Comdex Computer Kit", Wiley Dreamtech, Delhi,
- 3 P. K. Sinha & Priti Sinha, "Computer Fundamentals", BPB Publications,.

### **References Books:-**

- 1 V. Raja Raman, "Introduction to Computers", PHI,
- 2 Alex Leon & Mathews Leon, "Introduction to Computers", Vikas Publishing House,
- 3 Norton Peter, "Introduction to computers", TMH,

## CA003: PROBLEM SOLVING AND PROGRAMMING IN C

L	T	P	Cr
3	0	4	5.0

**Problem Solving:** Problem - Solving Techniques: Steps for Problem – Solving, Using Computer as a Problem-Solving Tool: Design of Algorithms-Definition, Features of Algorithm, Criteria to be followed by an Algorithm, Top Down Design; Analysis of Algorithm Efficiency: Redundant Computations, Referencing Array Elements, Inefficiency Due to Late Termination, Early Detection of Desired Output Condition, Trading Storage for Efficient Gains

**Introduction to C:** History and salient features of C, structure of C program, writing and compiling C program, Errors – syntax, semantic, linker, logical and runtime. The C preprocessor, #define, #ifdef, Predefined Names Defined by Preprocessor; Macros Vs Functions

**Variables and Constants:** Character Set; Identifiers and Keywords- Rules for Forming Identifiers, Keywords; Data Types and Storage; Data Type Qualifiers; Variables; Declaring Variables; Initialising Variables; Constants-Integer Constants, Floating Point Constants, Character Constants, String Constants, Symbolic Constants

**Operators and Expressions** Assignment Statements, Arithmetic Operators, Relational Operators, Logical Operators, Comma and Conditional Operators, Type Cast Operator, Size of Operator, C Shorthand, Priority of Operators

**Control statements:** Decision Control Statements - The *if* Statement, The *switch* Statement; Loop Control Statements- The *while* Loop, The *do-while* Statement, The *for* Loop, The Nested Loop; The *Goto* Statement; The *Break* Statement; The *Continue* Statement

**Arrays and Strings:** Array Declaration-Syntax of Array Declaration, Size Specification; Array Initialization - Initialization of Array Elements in the Declaration, Character Array Initialization; Subscript; Processing the Arrays; Multi-Dimensional Arrays. Declaration and Initialization of Strings; Display of Strings Using Different Formatting Techniques; Array of Strings; Built-in String Functions and Applications.

**Functions and Pointers:** Definition of a Function; Declaration of a Function; Function Prototypes; The Return Statement; Types of Variables and Storage Classes- Automatic Variables, External Variables, Static Variables, Register Variables; Types of Function Invoking; Call by Value, Recursion. Pointers and their Characteristics; Address and Indirection Operators; Pointer Type Declaration and Assignment- Pointer to a Pointer, Null Pointer Assignment; Pointer Arithmetic; Passing Pointers to Functions - A Function Returning More than One Value, Function Returning a Pointer; Arrays and Pointers; Array of Pointers; Pointers and Strings

**Structures and Unions:** Declaration of Structures; Accessing the Members of a Structure; Initializing Structures; Structures as Function Arguments; Structures and Arrays; Unions; Initializing an Union; Accessing the Members of an Union

**Files:** File Handling in C Using File Pointers - Open a file using the function *fopen* ( ), Close a file using the function *fclose* ( ); Input and Output using file pointers - Character Input and Output in Files, String Input / Output Functions, Formatted Input / Output Functions, Block Input / Output Functions; Sequential Vs Random Access Files; Positioning the File Pointer; The Unbuffered I/O - The UNIX like File Routines

**Laboratory Work:** The laboratory work will be based on contents of course material like expression, control statements, functions arrays, strings, pointers, structures, File handling.

### Text Books

1. Kernighan, B.W. and . Ritchie D.M, *The C Programming Language* ( ANSI-C version), PHI
2. Kanetkar, Y.P. *Let us C*, BPB

### Reference Books

1. Schildt, Herbert, *The Complete Reference C++*, Tata Mcgraw Hill
2. Kaicker, Sudhir, *The complete ANSI C*, BPB

## HU004: PERSONALITY DEVELOPMENT & COMMUNICATION SKILLS – I

L	T	P	Cr
3	1	0	3.5

- Objectives:**
1. To develop the skills of proper self expression, social communication, spoken English, correct pronunciation, voice modulation and business etiquettes.
  2. To develop personality, communication skills and enhance self-confidence of students.

### MODULE-I

**Grammar:** Basic fundamental of grammar and usage, how to improve command over spoken and written English with stress o Noun, Verb Tense and Adjective. Sentence errors, Punctuation, Vocabulary building to encourage the individual to communicate effective and diplomatically, common errors in business writing.

**Introduction to Business Communication:** Basic forms of communication, Process of communication, Principles of effective Business Communication, 7 Cs. ( 18 hours)

### MODULE-II

**Media of Communication:** Types of communication: Barriers of communication (Practical exercise in communication)

**Business letter writing:** Need, Functions and Kinds. Layout of letter writing. Types of letter writing: Persuasive letters, Request letters, Sales letters, Complaints and Adjustments.

**Departmental Communication:** Meaning, Need and types: Interview letters, Promotion Letters, resignation letters, news letters, Circulars, Agenda, Notice, Office memorandums, Office orders, Press release. (18 hours)

### MODULE-III

Aids to correct Business writing, Practical Grammar (basic Fundamentals), Sentence errors- Punctuation, Vocabulary building.

**Business Etiquettes:** Business manners. Body language gestures, Etiquette of the written word, Etiquette of the telephone, Handling business meetings.

Role play on selected topics with case analysis and real life experiences. (10 hours)

#### **Text Books:-**

1. Wren & Mertin; *English grammar and composition*,
2. Sinha, K. K.; *Business Communication*, Galgotia Publishers
3. Robinson, David; *Business Etiquette*, Kogan Page.
4. Rogets *Thesaurus*.

#### **Reference Books:-**

1. *Hand Book of Practical Communication Skills-Chrissie Wrought*, published by JPH
2. Ray, Reuben; *Communication today – Understanding Creative Skills*, Himalaya

## MA002: FOUNDATION COURSE IN MATHEMATICS-II

L	T	P	Cr
3	1	0	3.5

**SETS:** Sets, Subsets, Equal Sets Universal Sets, Finite and Infinite Sets, Operation on Sets, Union, Intersection and Complements of Sets, Cartesian Product, Cardinality of Set, Simple Applications.

**RELATIONS AND FUNCTIONS:** Properties of Relations, Equivalence Relation, Partial Order Relation Function: Domain and Range, Onto, Into and One to One Functions, Composite and Inverse Functions, Introduction of Trigonometric, Logarithmic and Exponential Functions. [Hours: 11]

**PARTIAL ORDER RELATIONS AND LATTICES:** Partial Order Sets, Representation of POSETS using Hasse diagram, Chains, Maximal and Minimal Point, Glb, lub, Lattices & Algebraic Systems, Principle of Duality, Basic Properties, Sublattices, Distributed & Complemented Lattices. [Hours: 11]

**FUNCTIONS OF SEVERAL VARIABLES:** Partial Differentiation, Change of Variables, Chain Rule, Extrema of Functions of 2 Variables, Euler's Theorem.

**3D COORDINATE GEOMETRY:** Review of 2D Coordinate Geometry: Equations of Straight Lines, Circle, Ellipse, Parabola, Hyperbola. 3D Coordinate Geometry: Coordinates in Space, Direction Cosines, Angle Between Two Lines, Projection of Join of Two Points on a Plane, Equations of Plane, Straight Lines, Conditions for a line to lie on a plane, Conditions for Two Lines to be Coplanar, Shortest distance Between Two Lines, Equations of Sphere, Tangent plane at a point on the sphere. Equations of Ellipsoid, Paraboloid, Hyperboloid and Cylinder in Cartesian coordinate. [No. of Hrs: 10]

**MULTIPLE INTEGRATION:** Double Integral in Cartesian and Polar Coordinates to find Area, Change of Order of Integration, Triple Integral to Find Volume of Simple Shapes in Cartesian Coordinates. [No. of Hrs: 12]

**Text Books:-**

1. Kolman, Busby and Ross, "Discrete Mathematical Structure", PHI, 1996.

**Reference Books:**

1. H.K. Dass, "Advanced Engineering Mathematics"; S.Chand & Co.
2. S.K. Sarkar, "Discrete Maths"; S. Chand & Co., 2000



## CA004: DATA AND FILE STRUCTURES

L	T	P	Cr
3	0	2	4.0

**Analysis of Algorithms** - Mathematical Background, Process of Analysis, Calculation of Storage Complexity, Calculation of Run Time Complexity.

**Arrays** ; Arrays and Pointers; Sparse Matrices; Polynomials; Representation of Arrays-Row Major Representation, Column Major Representation; Applications

**Lists:** Abstract Data Type-List; Array Implementation of Lists; Linked Lists-Implementation;Doubly Linked Lists-Implementation; Circularly Linked Lists-Implementation; Applications.

**Stacks:** Abstract Data Type-Stack; Implementation of Stack using Arrays and Stack using Linked Lists; Algorithmic Implementation of Multiple Stacks; Applications

**Queues:** Abstract Data Type-Queue; Implementation of Queue - Array and Linked List Implementation; Implementation of Multiple Queues ; Implementation of Circular Queues- Array Implementation, Linked List Implementation of a circular queue; Implementation of DEQUEUE - Array Implementation of a *Dequeue*, L inked List Implementation of *a dequeue*

**Trees:** Abstract Data Type-Tree; Implementation of Tree; Tree Traversals; Binary Trees; Implementation of Binary Tree; Binary Tree Traversals - Recursive Implementation of Binary Tree Traversals, Non Recursive Implementations of Binary Tree Traversals; Applications

**Advanced Trees:** Binary Search Trees- Traversing a Binary Search Trees, Insertion of a node into a Binary Search Tree, Deletion of a node from a Binary Search Tree; AVL Trees- Insertion of a node into an AVL Tree, Deletion of a node from and AVL Tree, AVL tree rotations, Applications of AVL Trees; B-Trees- Operations on B-Trees ; Applications of B-Trees.

**Searching and Sorting:** Linear Search; Binary Search; Internal Sorting - Insertion Sort, Bubble Sort, Quick Sort, 2-way Merge Sort, Heap Sort; Sorting on Several Keys and their applications.

**Advanced Data Structures:** Splay Trees - Splaying steps, Splaying Algorithm; Red-Black trees- Properties of a Red-Black tree; Insertion into a Red-Black tree; Deletion from a Red-Black tree; AA-Trees

**File Structures:** Terminology; File Organisation; Sequential Files – Structure, Operations, Disadvantages, Areas of use; Direct File Organisation; Indexed Sequential File Organisation

### **Laboratory Work**

Implementation of Stacks, Queues, Linked Lists, Trees, Graphs, Sorting and Searching algorithms.

### **Text Books:-**

1. Weiss, Mark, A., *Data Structures and Algorithm Analysis in C*, Dorling Kindersley
2. Kruse, R.L., *Data Structures and Program design in C*, Dorling Kindersley

### **Reference Books:-**

1. Aho, Alfred V., Ullman, Jeffrey D., and Hopcroft, John E., *Data Structures and Algorithms*, Addison Wesley
2. Tenenbaum, A. M., *Data Structures Using C*, Dorling Kindersley
3. Seymour Lipschutz, *Schaum's Outline Series of Theory and problems of data structures*, TMH

## CA005: INTRODUCTION TO DATABASE MANAGEMENT SYSTEMS

L	T	P	Cr
3	0	2	4.0

**The Basic Concepts:** Need for a Database Management System - The file based system, Limitations of file based system, The Database Approach; The Logical DBMS Architecture - Three level architecture of DBMS or logical DBMS architecture, Mappings between levels and data independence, The need for three level architecture; Physical DBMS Architecture- DML Precompiler, DDL Compiler, File Manager, Database Manager, Query Processor, Database Administrator, Data files indices and Data Dictionary, Commercial Database Architecture, Data Models

**Relational And ER Models:** The Relational Model- Domains, Attributes, Tuple and Relation, Super keys Candidate keys and Primary keys for the Relations; Relational Constraints- domain, Key and integrity, Dealing with Constraint Violations; Relational Algebra- Basic Set Operation, Cartesian Product, Relational Operations; Entity Relationship (ER) Model- Entities, Attributes, Relationships; E-R Diagram; Conversion of E-R Diagram to Relational Database.

**Database Integrity and Normalization:** Relational Database Integrity- The Keys, Referential Integrity, Entity Integrity; Redundancy and Associated Problems; Single-Valued Dependencies; Single-Valued Normalisation- The First Normal Form, The Second Normal Form, The Third Normal Form, Boyce Codd Normal Form; Desirable Properties of Decomposition - Attribute Preservation , Lossless-join Decomposition, Dependency Preservation, Lack of redundancy; Rules of Data Normalisation - Eliminate Repeating Groups, Eliminate Redundant Data, Eliminate Columns Not Dependent on Key

**File Organisation in DBMS:** Physical Database Design Issues; Storage of Database on Hard Disks; File Organisation and Its Types - Heap files (Unordered files), Sequential File Organisation, Indexed (Indexed Sequential) File Organisation, Hashed File Organisation; Types of Indexes; Index and Tree Structure; Multi-key File Organisation - Need for Multiple Access Paths, Multi-list File Organisation, Inverted File Organisation; Importance of File Organisation in Databases

**Structured Query Language and Transaction Management:** What is SQL?; Data Definition Language; Data Manipulation Language; Data Control; Database Objects: Views, Sequences, Indexes and Synonyms; Table Handling; Nested Queries. The Transactions; The Concurrent Transactions; The Locking Protocol- Serialisable Schedules, Locks, Two Phase Locking (2PL); Deadlock and its Prevention; Optimistic Concurrency Control. Recovery- Kinds of failures, Failure controlling methods, Database errors; Recovery Techniques; Security & Integrity- Relationship between Security and Integrity, Difference between Operating System and Database Security; Authorization.

**Distributed and Client Server Databases:** Need for Distributed Database Systems; Structure of Distributed Database; Advantages and Disadvantages of DDBMS; Design of Distributed Databases- Data Replication, Data Fragmentation; Client Server Databases- Architecture, Computing, Structure and Advantages

**Application Development: Development of a Hospital Management System:** Need, Creating a Database for HMS; Developing Front End Forms; Reports ; Using Queries and Record set. Issues relating to Software Development, Testing and Maintenance

### LABORATORY EXERCISES:

(USING MS-ACCESS)

1. Getting Familiar with Access Objects: Tables, Queries, Forms, Reports, and Modules.
2. Creating Database: Creating database using wizards, documenting the database, creating own databases.
3. Creating Tables: Working with tables in design view, setting field properties, naming fields, setting data types, setting primary key, multiple field primary keys, creating indexes, using table wizard.
4. Creating Queries: Working with query design grid, adding tables, adding fields, sorting records, setting field criteria, planning for null values, using simple query wizard – summarizing your records.
5. Creating forms: Working in design view, components of a form in design view, sections of a form, assigning form properties, modifying form properties to create a dialog box, using form templates, creating forms with a wizard, auto forms.
6. Creating Reports: Using Report Wizards, Working with auto report, creating a report template, inserting a chart into a report with the chart wizard, printing report.
7. Creating Labels and Mail-Merge Documents: Using the Label wizard, using custom labels, printing multiple labels, merging access data with word documents.

### Text Books

1. Elmasri, R, Navathe S.B., *Fundamentals of Database Systems*, Addison Wesley
2. Korth, H.F., Silberschatz, S., Sudarshan, A., *Database Systems Concepts*, McGraw Hill
3. Date, C.J., *An Introduction to Database Systems*, Dorling Kindersley

### Reference Books

1. Garcia-Molina, Hector, Ullman, J.D. and Widom, J.D., *Database Systems: The Complete Book*, Dorling Kindersley
2. Desai, Bipin C., *An Introduction to Database Concepts*, Galgotia Publication

## CA006: OBJECT ORIENTED PROGRAMMING USING C++ AND JAVA

L	T	P	Cr
3	0	4	5.0

**Introduction:** Object Oriented vs. Procedural Programming ,OOP Features & Benefits, Identifying Object Classes, Class Identification Examples, Sample C++ Class Definition, Enhancement of C++ over C.

**Classes and Objects:** Defining member functions, Members access control, Use of scope resolution operator, Inline functions, Nesting of member functions, Static data members, Static member functions, Array of objects, Friend functions.

**Constructors and Destructors:** Types of constructors- default, parameterized and copy constructors, Dynamic constructors. Destructors for destroying objects, new and delete operators.

**Operator Overloading and Type Conversions:** Overloading unary, binary operators, Operator overloading using friend functions, Rules for overloading operators, Type conversions.

**Inheritance:** General concepts of Inheritance, Types of derivation. Types of inheritance. Constructors in derived classes, Containership, Polymorphism with pointers, Pointers, Virtual functions and Polymorphism.

**Files and Streams:** Streams, Unformatted and Formatted I/O operations, Managing output with manipulators, File Streams, opening, reading, writing to file.

**Templates and Exception Handling:** Class templates and function templates, overloading of template functions, Basics of exception handling, Exception handling mechanisms.

**Java:** Primitive Data Types and Variables, Operators, Expressions and Statements, Decision and Interactive Constructs, Classes and Objects, Inheritance and Polymorphism, Packages and Interfaces, Exception handling, I/O in Java, Strings and Characters, Exploring Java I/O, Introduction to Applets, Graphics and User Interfaces, Networking Features and Java Servlets.

### LABORATORY WORK

Implementation of object-oriented features using C++ and Java including inheritance, overloading, Polymorphism, Visual Programming etc.

#### **Text Books:-**

1. Balaguruswamy, E., *Objected Oriented Programming with C++*, Tata McGraw Hill
2. Cornell, Gary, and Horstmann, Cay, S., *Core Java 2 Vol I- Fundamentals* Prentice Hall
3. Cornell, Gary, and Horstmann, Cay, S., *Core Java 2 Vol II- Advanced features* , Prentice Hall

#### **Reference Books :-**

1. Deitel, H.M. and Deitel,P.J., *C++ How to Program*, PHI
2. D. Ravichandran, *Programming with C++*, TMH

## CA007: OPERATING SYSTEM CONCEPTS AND NETWORKING MANAGEMENT

L	T	P	Cr
3	0	2	4.0

**Introduction to Operating System :** Meaning and Evolution of Operating System - Serial Processing, Batch Processing, Multiprogramming; Operating System Structure- Layered Structure Approach, Virtual Machine, Client-Server Model, Kernel Approach. Classification of Advanced Operating System - Architecture Driven Operating System, Application Driven Operating System; Characteristics of Modern Operating System - Microkernel Architecture, Multithreading, Symmetric Multiprocessing

**Introduction to Networking Concepts:** The Topologies; Characteristics of the OSI Layers; OSI Models and Communication between Systems; Interaction between OSI Model Layers; Protocols Types of Networks- Local Area Network (LANs), Metropolitan Networks (MANs), Wide Area Network (WANs); Medium; Data Flow; Physical Connection, Transmission Media; Connecting Devices- Repeaters, Hubs, Bridges, Routers, Gateways.

**Internetworking Concept, Architecture and Protocols:** History of internetworking; Packet Switching; Internetworking Concepts; Internet Addresses Object-Based Programming; Configuring IP Addresses; TCP/ IP; Additional TCP/ IP – Related Protocols; Application Layer Protocols- File Transfer Protocols, Trivial File Transfer Protocol (TFTP), TELNET, Remote login, Electronic Mail (Email); World Wide Web; Domain Name System; SNMP and UDP

**Linux Operating System:** Features; drawbacks; and components of Linux- Memory Management Subsystems, Linux Process and Thread Management, File Management System, Device Drivers, : linux Commands ,Utilities and Editor; User to User communication; Unix System Administration – System administration, Installing Linux, booting the system, Maintaining User Accounts, File Systems and Special Files, Backups and Restoration.

**Windows 2000:** Windows 2000 Operating System Architecture - Peer-To-Peer Network-Domains, Network Protocols, File Services, Shared Folders, Distributed File System, Print Services; Using the Mapped Drive - Printing a Mapped Drive, Disconnecting a Mapped Drive, Viewing Directory Information, Creating a Shared Folder, Logging off a Client. Using Windows 2000 and Client- Logging on to the Network, Browsing Network Resources 1, Accessing Network Resources Using My Network Places, Mapping a Folder; Advanced Windows 2000 Networking -Windows 2000 Domains, Workgroups & Trusted Relationships- Concept of Domains, Trust Relationships, Building Domains; User Administration; Remote Access. Introduction to Windows XP Networking - TCP/IP Protocol Setting for Windows XP, To Select a Network Protocol, Virtual Private Networks and Remote Networking; Windows XP in File System; Sharing Network Resources in Windows XP- Sharing Files Folders and drives in Windows XP; Enabling Offline File Features.

**Security and Management:** Goals of Computer Security; Security Problem and Requirements; Threat and Vulnerabilities; User Authentication; Security System and Facilities- System Access Control, Password Management, Privileged User Management, User Account Management, Data Resource Protection, Sensitive System Protection; Cryptography ; Intrusion detection; Computer-Security Classifications. Computer Security- Hardening Operating System and Application Code, File System Security, Local Security Policies, Services, Default Accounts, Network Activity- Malicious Code, Firewall; Fault Tolerant system; BACKUP and UPS

**Main Issues In Windows Security Management-** Physical Security Management, Logon Security Management, Users and Groups Management, Managing Local and Global Groups, Managing User Accounts, Windows NT Domain Management; Domain Controller-the Primary Domain Controller (PDM), Backup Domain Controller (BDC); Windows Resources Management; Registry management; Printer Management; Managing Windows 2000 Operating System; Active Directory- Logical Structure, Physical Structure; Windows 2000 DNS Management; Managing Group Policy

**Laboratory Work:** The laboratory work will be based on contents of course material like – Windows, Linux/Unix, installation and management of users on windows 2000.

### **Text Books:-**

1. Comer D. E. ,”Inter Networking with TCP/IP: Principles, Protocol And Architecture”, PHI
2. Janet Valade, “ Spring into Linux” PE.
3. Michael Bech, Harold Bohma...”Linux Kernel Programming”, PE
4. Johnson M. Hart “Windows System Programming”PE

### **Reference Books:-**

- 1 Nameth Hein , et. All” Linux Administration Hand book”PE

## HU006: PERSONALITY DEVELOPMENT AND COMMUNICATION SKILL-II

L	T	P	Cr
3	1	0	3.5

**Objectives:- To develop the project writing and presentation skills in students and build confidence and leadership qualities**

### MODULE-I

Project and report writing, and proposals – how to write an effective report, basics of project writing, paragraph writing, paper reading and voice modulation, basics of project presentation.

How to make a presentation, the various presentation tools, along with guidelines of effective presentation, boredom factors in presentation and how to overcome them, interactive presentation & presentation as part of a job interview, art of effective listening. (16 hours)

### MODULE-II

Resume writing skills, guidelines for a good resume, how to face an interview board, proper body posture, importance of gestures and steps to succeed in interviews. Practice mock interview in classrooms with presentations on self. Self introduction – highlighting positive and negative traits and dealing with people with face to face. (12 hours)

### MODULE-III

Leadership – quality of a leader, leadership quiz with case study, knowing your skills and abilities. Introduction to group discussion techniques with debate and extempore, increase your professionalism. Writing of Cases for discussion (8 hours)

Audio Video recording and dialogue sessions on current topics, economy, education system, environment, politics. (4hours)

#### **Text Books:-**

1. *Essentials of Business Communication by Rajendra Paul, Sultan Chand & Sons*
2. *Reuben, Ray; Communication today – understanding creating skills, HPH, 2001.*

#### **Reference Books:-**

1. *E. H. McGraw, S. J.; Basic Managerial Skills for All. Fourth Edition, PHI*
2. *Stephen R. Covey; The seven habits of highly effective people.*
3. *Rogets Thesaur*

## MA003: DISCRETE MATHEMATICS

L	T	P	Cr
3	1	0	3.5

**Mathematical Logic:** Statement and notations, normal forms, theory and Inference for statement calculus, predicate calculus, Inference theory for predicate calculus.

**Relations and Functions:** Binary relations, Composition of relations; Equivalence relations and partitions; Transitive Closure, Partially ordered sets and lattice Hasse diagrams; Functions, Injection, Surjection and bijection; Composition of functions.

**Discrete Structures:** Bit vector and Bit Map implementation, Weighting Rule for Disjoint Union (i,j), Collapsing Rule for Find, Application of Set Union-Matrix.

**Graph and Tree:** Introduction to Tree and graph, Adjacency list, Traversal of graph, Breadth First Search, Depth First Search, Spanning Tree, Kruskal's algorithm, Prim's Algorithm. Shortest Path, Topological sort, Activity network.

**Boolean Algebra:** Special types of Lattices, Boolean Algebra, Basic circuits and theorems, Boolean expressions; Logic gates and relation of Boolean function.

**Algebraic structures:** Introduction to algebraic structures, semi groups, Groups and subgroups, Applications of algebra to control structure of a program, congruencies, applications of Congruence.

**Recursion and Recurrence Relations:** Recursive functions, iteration, sequences and discrete functions, Recurrence relations, Generating function and their applications.

### **Text Books:-**

1. Trembley, J.P. and Manohar, R., *Discrete Mathematical Structures with Applications to Computer Science*, TMH
2. Doerr, Alan. and Levasseur, K., *Applied Discrete Structures for Computer Science*, Galgotia

### **Reference Books :-**

1. Liu, C.L., *Elements of Discrete Mathematics*, Tata McGraw Hill
2. Ram Babu, *Discrete Mathematics*, Vinayak Publications

## CA008: BASICS OF SOFTWARE ENGINEERING

L	T	P	Cr
3	1	0	3.5

**Introduction:** Software Crisis, Software Processes & Characteristics, Software life cycle models, Waterfall, Prototype, Evolutionary and Spiral Models

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

[No. of Hrs.: 12]

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

**Software Project Planning:** Size Estimation like lines of Code & Function Count, Cost, Estimation Models, COCOMO, Risk Management.

[No. of Hrs.: 10]

**Software Design:** Cohesion & Coupling, Classification of Cohesiveness & Coupling, Function Oriented Design, Object Oriented Design

**Software Metrics:** Software measurements: What & Why, Token Count, Halstead Software Science Measures, Design Metrics, Data Structure Metrics,

[No. of Hrs.: 10]

**Software Testing:** Testing Process, Design of Test Cases, Types of Testing, Functional Testing, Structural Testing, Test Activities, Unit Testing, Integration Testing and System Testing. Debugging Activities

**Software Maintenance:** Management of Maintenance, Maintenance Process, Reverse Engineering, Software Re-engineering, Configuration Management, Documentation.

[No. of Hrs.: 12]

**Laboratory work: : Use of Software Engineering tools**

**Text Books:-**

1. K. K. Aggarwal & Yogesh Singh, "Software Engineering", 2nd Ed., New Age International,
2. R. S. Pressman, "Software Engineering – A practitioner's approach", McGraw Hill Int. Ed.,

**Reference Books :-**

1. Stephen R. Schach, "Classical & Object Oriented Software Engineering", IRWIN,
2. James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach", John Wiley & Sons.
3. I. Sommerville, "Software Engineering", Addison Wesley

## CA009: MANAGEMENT INFORMATION SYSTEM

L	T	P	Cr
3	0	2	4

**Objectives:-** The objective of the course is to acquaint the students about the concept of information system in business organizations, and also the management control systems.

### MODULE-I

**Introduction:** Definition, Purpose, Objectives and Role of MIS in Business Organization with particular reference to Management Levels. MIS Growth and Development, Location of MIS in the Organization – concept and design. Transaction Processing System, Decision Support System, Executive Information system, Expert System, and the recent developments in the field of MIS. (10 hours)

**System Development:** Concept of System, Types of Systems – Open, Closed, Deterministic, Probabilistic, etc. Relevance of choice of System in MIS, Integration of Organization Systems and Information Systems, System Development Life Cycle (8 hours)

### MODULE-II

System Analysis, Design and Implementation, MIS Applications in Business. (4 hours)

**Information Concepts:** Data and Information – meaning and importance, Relevance of Information in Decision Making, Sources and Types of Information, Cost Benefit Analysis – Quantitative and Qualitative Aspects, Assessing Information needs of the Organization. (12 hours)

### MODULE-III

**Information Technology:** Recent Developments in the Field of Information Technology: Multimedia Approach to Information Processing. Decision of Appropriate Information Technology for proper MIS (5 hours)

Choice of appropriate IT Systems – Database, Data warehousing & Datamining Concepts, Centralized and Distributed Processing. (8 hours)

#### **Text Book:-**

1. Parker, Charles Case, Thomas, “Management Information System: Strategy & Action”, TMH,
2. Javadekar, W.S.; Management Information System, TMH

#### **Reference books:-**

1. Arora, Ashok and Akshaya Bhatia, Information Systems for Managers, Excel Books,
2. Basandra, Suresh K, Management Information Systems. Wheeler Publishing,.



## CA010: SYSTEM ANALYSIS AND DESIGN

L	T	P	Cr
3	1	2	4.5

**Introduction to System Development:** Categories of Information Systems, Structured Analysis Method, System Prototype Method, Succeeding as System Analyst., Systems Development Life Cycle. Concept and Models requirements determination. Logical design. Physical design, communication, interviewing, presentation skills; group dynamics; group-based approaches. JAD structures walkthroughs.

**Requirement Analysis:** Basic Requirements, fact-Finding Techniques, Various Tools: Data Flow Diagrams, Data Dictionaries, Decision Tables, Decision Trees; Feasibility Study, feasibility considerations, steps in feasibility analysis, Cost and benefit analysis, Procedure for cost and benefit determination.

**Design:** System design considerations, Process and stages of system Design: Logical and Physical, selection of best alternate design strategy, Design of Input: Capturing data for Input, Input, validation, Design of Output: Output objectives, Types of Output, Presentation format of Output, user interface design.

**System Engineering and Quality Assurance:** Program Structure Chart, Purpose, Data Passing, Quality Software Design: Top Down Structure, Coupling, Cohesion, Span of Control, Module Size, and Shared Modules.

**Testing:** Managing Testing practices, Testing Strategies, Levels of Testing

**System Implementation:** Training, Conversion Methods,

**Computer Aided System/Software Engineering Tools:** Role and Benefit of CASE Tools, Categories of Automated Tools, Various components of CASE tools, CASE Repository.

**Design and Implementation of OO Platforms:** Object oriented analysis and design through object modeling technique, object modeling, dynamic modeling and functional modeling, object oriented design and object oriented programming systems for implementation, Unified Modelling Language.

**Case Study of Some Common Systems:** Inventory Control, Laboratory Management Systems, Hotel Reception System, Hospital Management System etc

The course should be based on lectures, case analysis and laboratory work. Cases should be used to illustrate each major topic in the course.

### LABORATORY WORK

The laboratory work will be based upon the major assignment based upon the various case study like

Inventory control, Hospital management, Library management, Railway/ airline reservation, Banking system, Loan management etc.

#### Text Books:-

1. Senn, James A., *Analysis and Design of Information Systems*, Tata McGraw Hill.
2. Rumbaugh, James, Jacobson, Ivar, and Booch, Grady, *Unified Modeling Language Reference Manual*, Addison-Wesley Object Technology Series

#### Reference Books:-

1. Hoffer, Jeffrey, A., George, Joey, F. and Valacich, Joseph, S., *Modern Systems Analysis and Design*, Pearson Education
2. Whitten, J.L., and Bentley, L.D., *System Analysis and Design Methods*, Tata McGraw Hill

## CA011: VISUAL BASIC PROGRAMMING

L	T	P	Cr
3	0	4	5.0

Visual Basic: Variable Names, Data Types, Assignment, If-then, If-then-else, if then-elseifelse, expression, print statement, arrays, variable declaration, built-in & User defined types, Subroutine and functions, Boolean Operators, Arithmetic Operator, For- .next, do loop, while-wend, Procedure/ Public, Private and Static & Dim Statement.

**[No. of Hrs.: 11]**

Structure of VB program, Forms & built in controls, Properties and events, Code Module, Scale Modes, Printer Object (Printing text, setting Fonts, graphics), Common dialog Boxes, picture controls, image-controls, send keys, MS-Common Controls, Error Handling, Classes, Control Arrays, MDI, SDI.

File Handling – Text and Binary Files, Files System Orbit Object.

**[No. of Hrs.: 11]**

Database Interface: Review of ANSI SQL, ODBC, Pass through ODBC, DAO, MS-Jet Engine, DB-Engine, Workspaces, Databases, recordsets, Data bound controls, ActiveX controls, ADO, Active X Data controls, RDO

Data view Window, Data Environment Designer, Crystal Report and Data Report Utility Using Visual Basic (VB) for Transaction Management, Concurrency Control, Interfacing with RDBMS, Backend Stored procedure Usage.

**[No. of Hrs.: 11]**

Help Writing: Building a help, System, Building & Topics File, Labeling the topics, Creating a help project, primary & secondary help window, linking to internet, Adding Multimedia, Using HTML help workshop, content sensitive help, help file. Overview of COM/DCOM using Windows API Functions, MAPI interface, Microsoft Transaction Server, Visual source safe, VB Script.

### **Text Books:-**

1. E. Petroustos, "Mastering Visual Basic 6.0", BPB Publications,
2. Perry, Greg, "Teach Yourself Visual Basic 6 in 21 Days", Techmedia,

### **References Books:-**

1. E. Petroustos, "Mastering Database Programming with Visual Basic 6", BPB Publications
2. Norton Peter, "Peter Norton's Guide to Visual Basic 6", Techmedia,

## BM081: BUSINESS ORGANIZATION & MANAGEMENT

L	T	P	Cr
3	1	0	3.5

**Introduction:** Business –Meaning and Contents, Business as a system, Business and Legal and Economic Environment, Forms of Business Organization (meaning, merits & demerits).

[No. of Hrs.:11]

**Management Thought:** Management Principles, Henry Fayol’s principles of management, Taylor’s Scientific Management, Management Process, Basic Functions (in short), Meaning, Nature and Process, Role of Manager.

Organizational Behavior- Need of Understanding human behavior in organizations, Challenges and opportunities for OB, Contributing disciplines to the field of OB, Conceptual, Models of OB. [No. of Hrs.:12]

**Managing Personnel-** HRM- Meaning and Functions, Manpower Planning, Job Analysis and Design, Training, Career Planning & Development, Motivation, Compensation Management.

**Managing Finance-**Concept of Fixed and Working Capital, Main Sources of Finance, Accounting: Meaning, Users, Budgeting-Meaning, Type of Budgets.

[No. of Hrs.:12]

**Managing Production-** Basic Concepts, Objectives, Elements of Productions, Planning and Control.

**Managing Sales and Marketing-** Basic Concepts of marketing, Sales Promotions (including Salesmanship)

[No. of Hrs.: 09]

**Text Books:-**

1. Kotler, “Philip, Marketing Management”, PHI
2. Maheshwari S.N., “Financial Management – Principles and Practice”, S. Chand & Sons.

**Reference Books:-**

1. Chadha N.K., “Human Resource Management- Issues, Case Studies & Experimental Exercises”
2. John W. Newstrom and Keith Davis, “Organisational Behaviour–Human Behaviour at work”.
3. Koontz and Wehrich, “Management - A global perspective”, McGraw Hill International Ed.,
4. Maheshwari S.N and Maheshwari S.K, “An introduction to Accountancy”, Vikas publishing house
5. Panneerselvam, Production and Operations Management, PHI
6. Robbins, Stephen P., “Organisational Behaviour”, PHI
7. Singh B.P. & Chhabra T.N., Business Organisation and Management Functions, Dhanpat Rai & Co

## BM082 ACCOUNTANCY AND FINANCIAL MANAGEMENT

L	T	P	Cr
3	1	0	3.5

**Accounting System:** Scope of Accounting; Accounting as an Information System; Role and Activities of an Accountant; Accounting Personnel; Nature of Accounting Function; Organisation Chart for Accounting and Finance.

**Accounting Concepts and Standards:** Accounting Framework; Concepts; Standards; Accounting Principles (GAAP); Attempts towards Standardisation ; Accounting Standards in India

**Basic Accounting Process: Preparation of Journal, Ledger and Trial Balance:** Accounting Equation; Classification of Accounts; Definitions of Journal and Ledger- Journalising Process , Ledger Posting, Balancing an Account; Trial Balance- Objectives, Total and Balance Method of Preparing the Trial Balance, Limitations of Trial Balance; Accounting Cycle

**Preparation and Analysis of Final Accounts:** Trading Account; Profit And Loss Account; Difference between Trading and Profit & Loss Account; Balance Sheet; Constructing a Balance Sheet; Classification of Balance Sheet's Items; Adjustment Entries- Closing Stock, Depreciation, Bad Debts, Provision for Bad and Doubtful Debts, Salaries and Wages, Outstanding Expenses, Prepaid Expenses, Accrued Income, Income Received in Advance,

**Funds Flow and Cash Flow Statements:** Statements of changes in Financial Positions; Fund Flow Statement; Analysing Changes in Working Capital; Sources of Funds; Uses (Applications) of Funds; Cash Flow Statement; Sources and Uses of Cash

**Ratio Analysis :** Long-term Solvency Ratios, Short-term Solvency Ratios, , Activity or Turnover Ratios, Profitability Ratios, Market Test Ratios

**Introduction to Financial Management:** Evolution and Significance of Financial Management; Principles of Financial Management, Agency Relationship

**Time Value of Money and Investment Decisions:** Determining The Future Value, Annuity

**Working Capital Management:** Characteristics of Current Assets; Operating Cycle Concepts, Factors Influences Working Capital Environment, Estimating working capital Requirement. **Cash and Treasury Management-** Treasury Risk Management, Functions of Treasury Department; Cash Management- Motives for Holding Cash, Cash Planning, Determining the Optimum Cash Balance; Methods of Cash Flow Budgeting; Investing Surplus Cash; Cash Collection and Disbursements. **Receivables Management:** Terms of Payment, Credit Policy Variables, Credit Evaluation, Monitoring Receivables, Factoring., **Inventory Management-** Reasons for Holding Inventory, Objectives of Inventory Management, Techniques of Inventory Control, Modern Techniques , Traditional Techniques.

### **Text Books:-**

1. J.C.Katyal, " Principles A Book-Keeping".
2. Jain and Narang, " Principles of Accounting".
- 3 I.M.Pandey, " Financial Management, Vikas Publications.

### **Reference Books:-**

1. P.H.Barrett, " Computerized Accounting", BPB.

## MA004: STATISTICAL AND NUMERICAL COMPUTING

L T P Cr

3 1 2 4.5

**Combinatorics:** Permutation and Combination, Repetition and Constrained Repetition, Binomial Coefficients, Binomial Theorem.

**Probability:** Definition of Probability, Conditional Probability, Baye's Theorem

[No. of Hrs: 10]

**Pseudo Random Number Generation:** Uniform Distribution- Method of Generation (Discrete Case), Inversion Method (Exponential Distribution), Acceptance and Rejection

**Probability Distributions:** Review of Mean & Standard Deviation, Mathematical Expectation, Moments, Moment Generating Functions, Binomial, Poisson and Normal Distributions.

**Correlation:** Karl Person Coefficient of Correlation, Spearman's Rank Correlation, Least Square Method: Straight Line, Parabola and Exponential Curves: Regression Analysis.

[No. of Hrs: 15]

**Floating Point Arithmetic and Errors:** Floating Point Representation; Sources of Errors; Propagated Errors

**Interpolation:** Operators: Shift, Forward Difference, Backward Difference Operators and their Inter-relation, Interpolation Formulae-Newton's Forward, Backward and Divided Difference Formulae: Lagrange's Formula.

**Solution Of Non Linear Equation:** Bisection Method, False Position Method, Newton – Raphson Method for Solving Equation Involving One Variable only.

[No. of Hrs: 12]

**Solution Of Linear Simultaneous Equations:** Gaussian Elimination Method with and without Row Interchange: LU Decomposition: Gauss - Jacobi and Gauss-Seidel Method; Gauss – Jordan Method and to find Inverse of a Matrix by this Method.

**Numerical Differentiation-** First and Second Order Derivatives at Tabular and Non-Tabular Points, Numerical Integration, Trapezoidal Rule, Simpsons 1/3 Rule: Error in Each Formula (without proof). [No. of Hrs: 12]

### Text Books:-

1. Hogg, Robert V., Tanis, Elliot A. and Rao, Jagan M., *Probability and Statistical Inference*, Prentice Hall
2. Conte, S.D and Carl D. Boor, *Elementary Numerical Analysis: An Algorithmic approach*, TMH
3. Johnson, R., Miller, I. and Friends, J., *Miller and Freund's Probability and Statistics for Engineers*, Pearson Education
4. S.S. Sastry, " *Numerical Analysis* PHI

### Reference Books:-

1. Meyer, P.L, *Introductory Probability and Statistical Applications*, Addison Wesley Press
2. Gerald C.F and Wheatley P.O., *Applied Numerical Analysis*, Pearson Education
3. Mathew, J.H., *Numerical Methods for Mathematics, Science and Engineering*, Prentice Hall Inc
4. Jain M.K., Iyengar, S.R.K., and Jain, R.K. *Numerical Methods for Scientific and Engineering Computation*, New Age International

## CA012: .NET PROGRAMMING

L	T	P	Cr
3	0	2	4.0

Net architecture, Namespaces, Assemblies, object oriented features, memory management, interoperation with IOM, transaction in .NET, Structured exception handling, code access security.

**[No. of Hrs.: 11]**

VB.NET- Similarities & differences with Visual Basic, windows focus, ADO.NET, working with databases, object oriented features.

**[No. of Hrs.: 11]**

ASP.NET- Similarities & difference with ASP, Architecture, web-form, development, XML, databases interface.

**[No. of Hrs.: 11]**

C++ .NET - Similarities & differences with C/C++, Creating components, window four, menus, validation, database interface.

**[No. of Hrs.: 11]**

**Text Books:-**

1. A. Chakraborti et. al., "Microsoft .NET framework", PHI,
2. M. Reynolds et. al., ".NET Enterprise", Wrox/SPD

**References Books:-**

1. Richard Blaur & Mathew Reynolds, "Beginning VB.net 2003", 3rd Edition, Wiley Dream Tech.,
2. Chris Willman, John Kauffman, "Beginning ASP.net 1.1 with VB.NET 2003", Wiley Dream Teach,
3. Chris Ullman, John Kauffman, "Beginning ASP.NET with Visual #.net 2003", Wiley Dream Tech

## CA013: COMPUTER NETWORKS

**L T P Cr**

**3 0 4 5.0**

Basic Concepts: Components of data communication, distributed processing, standards and organizations. Line configuration, topology, transmission mode, and categories of networks. OSI and TCP/IP Models: Layers and their functions, comparison of models. Digital Transmission: Interfaces and Modems: DTE-DCE Interface, modems, cable modems. Transmission Media: Guided and unguided, Attenuation, distortion, noise, throughput, propagation speed and time, wavelength, Shannon Capacity, comparison of media.

**[No. of Hrs.: 12]**

Telephony: Multiplexing, error detection and correction: Many to one, one to many, WDM, TDM, FDM, circuit switching, packet switching and message switching.

Data Link control protocols: Line discipline, flow control, error control, synchronous and asynchronous protocols, character and bit oriented protocols, Link access procedures.

Point to point protocols: Transmission states, PPP layers, LCP, Authentication, NCP.

ISDN: Services, historical outline, subscriber's access, ISDN, Layers, and broadband ISDN.

**[No. of Hrs.: 12]**

Devices: Repeaters, bridges, gateways, routers, The Network Layer, Design Issues, Routing Algorithms, Congestion Control Algorithms, Quality of Service, Internetworking, Network- Layer in the Internet.

**[No. of Hrs.: 10]**

Transport and upper layers in OSI Model: Transport layer functions, connection management, Functions of session layers, Presentation layer, and Application layer.

**[No. of Hrs.: 10]**

**Text Books:-**

1. A. S. Tanenbaum, "Computer Networks"; Pearson Education Asia,
2. Behrouz A. Forouzan, "Data Communication and Networking", TMH

**References Books:-**

1. D. E. Comer, "Internetworking with TCP/IP", Pearson Education Asia,
2. William Stallings, "Data and computer communications", Pearson education Asia

## CA014: INTERNET CONCEPTS AND WEB DESIGN

L	T	P	Cr
3	0	4	5

### Scripting Languages

**The Internet:** Classification of Networks; Networking Models ; Packet Switching; Accessing the Internet; Internet Protocols- Internet Protocol (IP), Transmission Control Protocol (TCP); Internet Address- Structure of Internet Servers Address, Address Space; How does the Internet work; Intranet & Extranet; Internet Infrastructure; protocols and Services on Internet - Domain Name System, SMTP and Electronic Mail, Http and World Wide Web, Usenet and Newgroups, FTP, Telnet, Internet Tools, Search Engines, Web Browser

**Introduction to HTML:** What is HTML; Basic Tags of HTML- HTML Tag, TITLE Tag, BODY Tag; Formatting of Text – Headers, Formatting Tags, PRE Tag, FONT Tag, Special Characters; Working with Images; META Tag;

**Advanced HTML:** Links- Anchor tag; Lists- Unordered Lists, Ordered Lists, Definition Lists; Tables - TABLE, TR and TD Tags, Cell Spacing and Cell Padding, Colspan and Rowspan; Frames – Frameset, FRAME Tag, NOFRAMES Tag; Forms- FORM and INPUT Tag, Text Box, Radio Button, Checkbox, SELECT Tag and Pull Down Lists, Hidden, Submit and Reset; Some Special Tags – COLGROUP, THREAD, TBODY, TFOOT, \_blank, \_self, \_parent, \_top, IFRAME, LABEL, Attribute for <SELECT>, TEXTAREA.

**Introduction to JavaScript:** JavaScript Variables and Data Types- Declaring Variables, Data Types; Statements and Operators; Control Structures- Conditional Statements, Loop Statements; Object-Based Programming – Functions, Executing Deferred Scripts, Objects; Message box in Javascript- Dialog Boxes, Alert Boxes, Confirm Boxes, Prompt Boxes; Javascript with HTML – Events, Event Handlers; Forms- Forms Array.

**VB Script:** What is VBScript; Adding VBScript Code to an HTML Page - VB Script Basics, VBScript Data Types, VBScript Variables, VBScript Constants, VBScript Operators; Using Conditional Statements; Looping Through Code; VBScript Procedures; VBScript Coding Conventions; Dictionary Object in VBScript- Methods and Object Properties; Err Object - Methods and Properties.

**Dreamweaver:** Using Dreamweaver; Create a Site Home Page; Design a Page in Layout View; Insert Images; Insert Text; Work in Standard View; View the Site Files; Link your Documents;

#### **Text Books:-**

1. Raj Kamal, *Internet and Web Technology*, TMH
2. P. Naughton and H.Schildt, *The Complete Reference Java 2*, TMH

#### **Reference Books:-**

1. Margaret Leaven Young, *The Complete reference Internet Millennium Edition*, TMH



## HU002: BUSINESS ECONOMICS

L T P Cr

3 1 0 3.5

**The Scope and Method of Economics**, The Economic Problem: Scarcity & Choice, The Price Mechanism, Demand & Supply Equilibrium: The concept of Elasticity and its Applications. The Production Process: Output decisions – Revenues, Costs and Profit Maximisation Laws of Returns & Returns to Scale; Economies and Diseconomies of Scale.

[No. of Hrs.: 12]

**Market Structure:** Equilibrium of a Firm and Price, Output Determination Under Perfect Competition, Monopoly, Monopolistic Competition & Oligopoly.

[No. of Hrs.: 12]

**Macro Economic Concerns:** Inflation, Unemployment, Trade-Cycles: Circular Flow upto Four Sector Economy, Government in the Macro Economy: Fiscal Policy, Monetary Policy, Measuring National Income and Output.

[No. of Hrs.: 10]

**The World Economy** – WTO, Globalisation, MNCs, Outsourcing, Foreign Capital in India, Trips, Groups of Twenty (G-20), Issues of Dumping, Export- Import Policy 2004-2009.

[No. of Hrs.: 10]

**Text Books:-**

1. Ahuja H.L., “Business Economics”, S. Chand & Co., New Delhi,
2. Ferfuson P.R., Rothschild, R and Ferguson G.J. “Business Economics”, Mac- Millan, Hampshire,
3. Karl E. Case & Ray C. Fair, “Principles of Economics”, Pearson Education, Asia,
4. Nellis, Joseph, Parker David, “The Essence of Business Economics”, Prentice Hall,

## EC001: DIGITAL ELECTRONICS

L	T	P	Cr
3	1	2	4.5

**Boolean Algebra** -Basics Laws of Boolean Algebra, Logic Gates, Simplifications of Boolean equations using K-maps, Code Conversion, (Binary, Octal, Hexadecimal), Overview of Gray codes and Excess – 3 codes.

[No. of Hrs: 11]

**Arithmetic Circuits** - Adder, Subtractor, Parallel binary adder/Subtractor, binary multiplier and divider.

**Combinational Circuits** - Multiplexers, De-Multiplexers, decoders, encoders, Design of code converters.

[No. of Hrs: 11]

**Flip-flops** - S-R, D, J-K, T, Clocked Flip-flop, Race around condition, Master slave Flip-Flop,

Realisation of one flip-flop using other flip-flop.

**Shift Registers** - Serial-in-serial-out, serial-in-parallel-out, parallel-in-serial-out and parallel-in-parallel-out, Bi-directional shift register.

[No. of Hrs: 11]

**Counters**- Ripple counter, Synchronous Counter, Modulo Counters, Ring Counter, Twisted Ring Counter.

**Memory Devices** - RAM, ROM, PAL & PLA

[No. of Hrs: 11]

**Text Books:-**

1. *Moris Mano, "Digital Logic and Computer Design", PHI*
2. *R. P. Jain, "Modern Digital Electronics", TMH.*

**References Books:-**

1. *R.L.Tokheim, "Digital Electronics, Principles and Applications", TMH*
2. *W.Gothman, "Digital electronics", PHI.*
3. *S. Salivahanan & S. Arivyhgan. "Digital circuits and design", Vikas Publication,*
4. *Malvino Leach, "Digital Principles and Application", TMH,*

## CA015: COMPUTER GRAPHICS & MULTIMEDIA

L	T	P	Cr
3	0	4	5.0

**Introduction:** The Advantages of Interactive Graphics, Representative Uses of Computer Graphics, Classification of Applications, Development of Hardware and Software for Computer Graphics, Conceptual Framework for Interactive Graphics, Overview, Scan Converting Lines, Scan Converting Circles, Scan Converting Ellipses.

**Graphics Hardware:** Hardcopy Technologies, Display Technologies, Raster-Scan Display Systems, The Video Controller, Random-Scan Display Processor, Input Devices for Operator Interaction, Image Scanners, Working exposure on graphics tools like Dream Weaver, 3D Effects etc.

**Clipping:** Southland-Cohen Algorithm, Cyrus-Beck Algorithm, Midpoint Subdivision Algorithm

[No. of Hrs.: 12]

**Geometrical Transformations:** 2D Transformations, Homogeneous Coordinates and Matrix Representation of 2D Transformations, Composition of 2D Transformations, The Window-to-Viewport, Transformation, Efficiency, Matrix Representation of 3D Transformations, Transformations as a Change in Coordinate System.

[No. of Hrs.: 10]

**Representing Curves & Surfaces :** Polygon Meshes, Parametric Cubic Curves, Quadric Surfaces.

**Solid Modeling:** Representing Solids, Regularized Boolean Set Operations, Primitive Instancing, Sweep Representations, Boundary Representations, Spatial Partitioning Representations, Constructive Solid Geometry, Comparison of Representations, User Interfaces for Solid Modeling.

[No. of Hrs.: 10]

**Introductory Concepts of Multimedia,** Definition, CD-ROM and the multimedia highway, Uses of Multimedia, Introduction to making multimedia – The stages of Project, the hardware & software requirements to make good multimedia, Multimedia skills and training, Training Opportunities in Multimedia, Motivation for Multimedia usage

[No. of Hrs.: 12]

**Text Books:-**

1. *Foley, Van Dam, Feiner, Hughes, Computer Graphics Principles & Practice*
2. *Ralf Skinmetz and Klana Naharstedt, "Multimedia: Computing, Communications and Applications", Pearson*

**Reference Books:-**

1. *D. Harn & Baker: Computer Graphics, PHI*
2. *D.J. Gibbs & D.C. Tsichritzis: Multimedia Programming Object, Environment & Framework*
3. *Foley, J.D. & Van Dam, A: Fundamentals of Interactive Computer Graphics.*
4. *Rogers & Adams, "Mathematical Elements for Computer Graphics", McGraw Hill,*
5. *Tay Vaughan, "Multimedia: Making it Work", TMH*

## CA016: MOBILE COMPUTING

L	T	P	Cr
3	0	4	5.0

**Introducing the Mobile Internet:** The Mobile Internet is here, The Rise of Mobile data. Key Services for the mobile Internet, Business opportunities.

[No. of Hrs.:10]

**WAP:** the Mobile Internet Standard: Making the Internet Mobile: Challenges and Pitfalls, Overview of the Wireless Application Protocol

[No. of Hrs.:11]

**Implementing WAP Services:** The Wireless Markup Language, Enhanced WML: WML Script and WTAI, User Interface Design: Marking Wireless Applications Easy to Use.

[No. of Hrs.:12]

**Advanced WAP:** Tailoring Content to the Client, Push Messaging, Wireless Telephony Applications, Building and Deploying End-to-End WAP Services. Where Next: The Mobile Internet Future

[No. of Hrs.:11]

**Text Book:-**

1. Sandeep Singhal, "The Wireless Application Protocol, Writing Applications for Mobile Internet", Pearson Education



## EN001: ENVIRONMENTAL STUDIES

L T P Cr

3 1 0 3

**Multidisciplinary nature of environmental studies:** Definition, scope and importance, Need for public awareness (2 lectures)

**Renewable and non-renewable resources:** Natural resources and associated problems- a) Forest resources : Use and over-exploitation, deforestation, case studies; Timber extraction, mining, dams and their effects on forest and tribal people; b) Water resources : Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dams-benefits and problems; c) Mineral resources : Use and exploitation, environmental effects of extracting and using mineral resources, case studies; d) Food resources : World food problems, changes caused by agriculture and overgrazing, effects of modern agriculture, fertilizer-pesticide problems, water logging, salinity, case studies; e) Energy resources : Growing energy needs, renewable and non renewable energy sources, use of alternate energy sources. f) Land resources: Land as a resource, land degradation, man induced landslides, soil erosion and desertification. Role of an individual in conservation of natural resources; Equitable use of resources for sustainable lifestyles. (8 lectures)

**Ecosystems:** Concept of an ecosystem. Structure and function of an ecosystem. Producers, consumers and decomposers; Energy flow in the ecosystem. Ecological succession. Food chains, food webs and ecological pyramids. Introduction, types, characteristic features, structure and function of the following ecosystem: (a). Forest ecosystem; (b) Grassland ecosystem; (c) Desert ecosystem; (d) Aquatic ecosystems (ponds, streams, lakes, rivers, oceans, estuaries) (6 lectures)

**Biodiversity and its conservation:** Introduction – Definition : genetic, species and ecosystem diversity. Biogeographical classification of India. Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values. Biodiversity at global, National and local levels. India as a mega-diversity nation. Hot-spots of biodiversity. Threats to biodiversity - habitat loss, poaching of wildlife, man-wildlife conflicts. Endangered and endemic species of India. Conservation of biodiversity - In-situ and Ex-situ conservation of biodiversity. (8 lectures)

**Environmental Pollution:** Definition, Cause, effects and control measures of :- Air pollution; Water pollution; Soil pollution; Marine pollution; Noise pollution; Thermal pollution; Nuclear hazards and solid waste Management : Causes, effects and control measures of urban and industrial wastes. Role of an individual in prevention of pollution.. Pollution case studies. Disaster management : floods, earthquake, cyclone and landslides. (8 lectures)

**Social Issues and the Environment:** From Unsustainable to Sustainable development; Urban problems related to energy; Water conservation, rain water harvesting, watershed management; Resettlement and rehabilitation of people; its problems and concerns. Case Studies; Environmental ethics : Issues and possible solutions; Climate change, global warming, acid rain, ozone layer depletion, nuclear accidents and holocaust. Case Studies. Wasteland reclamation. Consumerism and waste products. Environment Protection Act. Air (Prevention and Control of Pollution) Act, Water (Prevention and control of Pollution) Act; Wildlife Protection Act, Forest Conservation Act, Issues involved in enforcement of environmental legislation, Public awareness. (7 lectures)

**Human Population and the Environment:** Population growth, variation among nations; Population explosion – Family Welfare Programme., Environment and human health; Human Rights. Value Education; HIV/AIDS, Women and Child Welfare, Role of Information Technology in Environment and human health. (6 lectures)

**Field work :** Visit to a local area to document environmental assets river/forest/ grassland/hill/ mountain; Visit to a local polluted site-Urban/Rural/Industrial/Agricultural; Study of common plants, insects, birds; Study of simple ecosystems-pond, river, hill slopes, etc. (Field work = 5 lecture hours)

(NOTE: Syllabus for Environment Studies includes class room teaching and Field Work. The syllabus is divided into eight units covering 50 lectures. The first seven units will cover 45 lectures which are class room based to enhance knowledge skills and attitude to environment. Unit eight is based on field activities which will be covered in five lecture hours and would provide student first hand knowledge on various local environmental aspects. Field experience is one of the most effective learning tools for environmental concerns. This moves out of the scope of the text book mode of teaching into the realm of real learning in the field, where the teacher merely acts as a catalyst to interpret what the student observes or discovers in his/her own environment. Field studies are as essential as class work and form an irreplaceable synergistic tool in the entire learning process.)

### Text Books:-

1. Mhaskar A.K., Matter Hazardous, Techno-Science Publication
2. Miller T.G. Jr. Environmental Science, Wadsworth Publishing Co. Clark R.S., Marine Pollution, Clarendon Press Oxford
3. Trivedi R. K. and P.K. Goel, Introduction to air pollution, Techno-Science Publication
4. Agarwal, K.C. Environmental Biology, Nidi Publ. Ltd. Bikaner.

### Reference Books:-

1. Bharucha Erach, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380 013, India, Email:mapin@icenet.net (R)
2. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. Environmental Encyclopedia, Jaico Publ. House, Mumabai,
3. De A.K., Environmental Chemistry, Wiley Eastern Ltd.

## CA019 BASICS OF DESIGN AND ANALYSIS OF ALGORITHMS

L	T	P	Cr
3	1	0	4.0

Mathematical Preliminaries: Review of growth functions, Solution of difference equations. Sorting and Order Statistics Merge sort, Heap sort, Quick sort, radix sort, bucket sort, median and order statistics.

[No. of Hrs.: 11]

Advanced Data Structures Review of binary search trees, dynamic set operation, red black trees, binomial heap. Dynamic Programming Matrix multiplications, longest common subsequence and optimal polygon triangulation problems.

[No. of Hrs.: 11]

Greedy Algorithms: Activity selection, Huffman coding, and task scheduling problem. Amortized Analysis Aggregate, accounting, and potential methods.

[No. of Hrs.: 11]

String Matching, Naïve String Matching, Rabin karp and KMP algorithms.

[No. of Hrs.: 11]

### **Text Books:-**

1. T. H. Cormen, C. E. Leiserson, R. L. Rivest, Clifford Stein, "Introduction to Algorithms",., PHI

### **References Books:-**

1. A. V. Aho, J. E. Hopcroft, J. D. Ullman, "The Design and Analysis of Computer Algorithms", Addison Wesley
2. Ellis Horowitz and Sartaz Sahani, "Computer Algorithms", Galgotia Publications,
3. D. E. Knuth, "The Art of Computer Programming", 2nd Ed., Addison Wesley

## CA020 COMPUTER NETWORK SECURITY

L	T	P	Cr
3	1	0	4.0

Introduction: Attacks, Services and Mechanism, Model for Internetwork Security. Cryptography: Notion of Plain Text, Encryption, Key, Cipher Text, Decryption and cryptanalysis; Public Key Encryption, digital Signatures and Authentication.

**[No. of Hrs.: 12]**

Net Work Security : Authentication Application: Kerveros, X.509, Directory Authentication Service, Pretty Good, Privacy, S/Mime.

**[No. of Hrs.: 12]**

IP security Architecture: Overview, Authentication header, Encapsulating Security Pay Load, combining Security Associations, Key Management. Web Security: Requirements, Secure Socket Layer, Transport Layer Security, and Secure. Electronic Transactions.

**[No. of Hrs.: 10]**

Network Management Security: Overview of SNMP Architecture-SMMPV11; Communication Facility, SNMPV3. System Security: Intruders, Viruses and Related Threats, Firewall Design Principles.

**[No. of Hrs.: 10]**

***Text Books:***

1. W. Stallings, *Networks Security Essentials: Application & Standards*, Pearson Education
2. W. Stallings, *Cryptography and Network Security, Principles and Practice*, Pearson Education,



## CA018 ARTIFICIAL INTELLIGENCE AND APPLICATIONS

L T P Cr

3 0 2 4.0

**Introduction to expert systems**, various subsets of expert systems as AI, ANNs, Fuzzy Set theory, the differences & comparisons of various theories

**Introduction and Overview of AI:** Historical foundations, development of logic, turning test, problem spaces, problem characteristics, characteristics of intelligent algorithm, structures and strategies for state space search.

**Problem solving techniques:** Heuristic search, A\* algorithm, AO\* algorithm, generate and test, hill climbing. Problem reduction, Constraint propagation

**Knowledge representation:** predicate logic, resolution in predicate logic, question answering, theorem proving.

**Semantic networks**, Frames and scripts, conceptual graphs. Game playing: Minimax and alpha beta procedures

**AI Programming Languages:** Introduction to LISP; Syntax and Numeric Functions; Basic List Manipulation Functions in LISP Functions; Predicates and Conditionals; Input, Output, and Local Variables; Iteration and Recursion; Property Lists and Arrays; PROLOG: List, Operators, Arithmetic; Cut & Fail; Backtracking

**Handling Inconsistent and Incomplete Knowledge:** Truth Maintenance Systems; Reasoning Techniques; Concept of Uncertainty; Bayes' Theorem; Certainty Factors and Rule-Based Systems; Bayesian Networks; Dempster-Shafter Theory

**Fuzzy set Theory:** Introduction, Basic definitions & terminology, Fuzzy union, intersection, complement. Fuzzy rules, relations & principles, Fuzzy inference systems

### LABORATORY WORK:

Programming in Prolog to implement Arithmetic operators, List Processing, Defining Human Relationships, Cut Operations, Files, Trees, Graphs and Natural Language Processing. Implementation of Heuristic and Minimax Searches using C/C++/Java.

### Text Books:-

1. Patterson, Dan W., *Introduction to Artificial and Expert Systems*, PHI
2. Luger, G.F., *Artificial Intelligence*, Pearson Education

### Reference Books:-

1. Sasikuma, r M. and Ramani, S., *Rule Based Expert System*, Norosa
2. Rich, E. and Knight K., *Artificial Intelligence*, TMH

## CA021 E-COMMERCE

L	T	P	Cr
3	0	2	4.0

**Introduction to E-Commerce:** The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, E-Commerce in Perspective.

**Business Strategy in an Electronic Age:** Supply Chains, Porter's Value Chain Model, Inter

Organizational Value Chains, Competitive Strategy, Porter's Model, First Mover Advantage,

Sustainable Competitive Advantage, Competitive Advantage using E-Commerce, Business Strategy, Introduction to Business Strategy, Strategic Implications of IT, Technology, Business Environment, Business Capability, Existing Business Strategy, Strategy Formulation & Implementation Planning, E-Commerce Implementation, E-Commerce Evaluation.

**No. of Hrs.: 12]**

**Business-to-Business Electronic Commerce:** Characteristics of B2B EC, Models of B2B EC, Procurement Management Using the Buyer's Internal Marketplace, Supplier-Oriented Marketplace, Intermediary-Oriented Marketplace, Just-in-Time Delivery, Other B2B Models, Auctions and Services from Traditional to Internet-Based EDI, Integration with Back-end Information Systems, The Role of Software Agents for B2B EC, Electronic Marketing in B2B, Solutions of B2B EC, Managerial Issues, Electronic Data Interchange (EDI), EDI: The Nuts and Bolts, EDI & Business.

**Intranet and Extranet:** Automotive Network Exchange, The Largest Extranet, Architecture of the Internet, Intranet, and Extranet, Intranet Software, Applications of Intranets, Intranet Application Case Studies, Considerations in Intranet Deployment, The Extranets, The Structure of Extranets, Extranet Products & Services, Applications of Extranets, Business Models of Extranet Applications, Managerial Issues.

**[No. of Hrs.: 12]**

**Electronic Payment Systems:** Is SET a Failure, Electronic Payments & Protocols, Security Schemes in Electronic Payment Systems, Electronic Credit Card System on the Internet, Electronic Fund Transfer and Debit Cards on the Internet, Stored-Valued Cards and E-Cash, Electronic Check Systems, Prospect of Electronic Payment Systems, Managerial Issues.

**Public Policy: From Legal Issues to Privacy:** EC-Related Legal Incidents, Legal, Ethical & Other Public Policy Issues, Protecting Privacy, Protecting Intellectual Property, Free Speech, Internet Indecency & Censorship, Taxation & Encryption Policies, Other Legal Issues: Contracts, Gambling & More, Consumer & Seller Protection in EC.

**[No. of Hrs.: 10]**

**Infrastructure for EC:** It takes more than Technology, A Network of Networks, Internet Protocols, Web-Based client/ Server, Internet Security, Selling on the Web, chatting on the Web, Multimedia delivery, Analyzing Web Visits, Managerial issues.

**Economics, Global & Other Issues in EC:** Competition in Marketspace, Some Issues in Digital Economy and Success Factors, Impacts on Industry Structure, Intermediaries, and Others, virtual Communities, Global Electronic Commerce, Electronic Commerce in Small companies, Research in EC, The Future of EC

**[No. of Hrs.: 10]**

**Text Books:-**

1. David Whiteley, "E-Commerce", Tata McGraw Hill
2. Eframi Turban, Jae Lee, David King, K. Michale Chung, "Electronic Commerce", Pearson Education

## CA022 INTERNET PROGRAMMING

L	T	P	Cr
3	0	2	4.0

Microsoft Visual InterDev: Web servers, Creating a project, Use of project Explorer, Toolbox window, Site design, Java Script., Data types, Control structures, Functions, Arrays, and Objects.

**[No. of Hrs.: 11]**

DHTML: CSS, Object Model collection, event model, filter and transitions, data binding with tabular data control. VB script and its utility functions.

**[No. of Hrs.: 10]**

Web servers- PWS set up, publishing information, and publishing Internet information server. Database: registering ODBC, database, ADO (active X data objects) ASP-Active server pages, client side and server side programming.

**[No. of Hrs.: 12]**

XML-Structuring data, DTD's using XML with HTML and CSS, XML parsers. Servlets.

**[No. of Hrs.: 11]**

**Text Books:-**

1. H.M.Dietel, P.J.Dietel, T.R.Neito, "Internet and worldwide web – how to program", Addison Wiley
2. H.Schildt, *The complete Java2 reference*, TMH, 1998.