



**BHARATI VIDYAPEETH
DEEMED UNIVERSITY, PUNE (INDIA)**

(Established u/s 3 of the UGC Act, 1956 vide Notification No.F.9-15/95-U-3 of the Govt. of India)

‘A’ Grade Accreditation by NAAC

Social Transformation Through Dynamic Education...

SCHOOL OF DISTANCE EDUCATION

PROGRAMME GUIDE

OF

BACHELOR OF COMPUTER APPLICATION

(B.C.A.)

Bachelor of Computer Applications

(B.C.A.)

Objectives: The objectives of the Programme shall be to develop youths to work in fields of Computer applications in various sectors together with internet technologies, E-business applications etc. The BCA Programme is focused on exposing students to business application areas.

Duration: The duration of the BCA degree programme shall be Three Years divided into Six Semesters.

Eligibility: In order to be eligibility for admission to Bachelor of Computer Applications, a candidate must have passed 10+2 in any stream or equivalent.

Scheme of Examination: The BCA examination will be of 4200 marks divided into 3 Parts as per details given below,

- | | | | |
|----|---------|-----------------|----------------------|
| 1. | BCA-I | (Sem. I & II) | Aggregate marks 1400 |
| 2. | BCA-II | (Sem. III & IV) | Aggregate marks 1400 |
| 3. | BCA-III | (Sem. V & VI) | Aggregate marks 1400 |

For courses in Practicals (Sem. I, II, III, IV, V) there will be Practical Examination 80 marks and viva Examination of 20 marks. For course on Project Work there will be oral presentation test consisting of 20 marks and written Report of 80 marks.

Award of Class: In order to pass in the Examination a candidate has to obtain 40 marks out of 100 (Sem- end Exam. 80 + Class work marks 20 taken together) in each course. The class will be awarded to the student on the basis of marks obtained in all the semesters taken together.

Aggregate Percentage of Marks	Class
40% & above - less than 50%	Pass Class
50% & above - less than 55%	Second Class
55% & above - less than 60%	Higher Second Class
60% & above - less than 70%	First Class
70% & above	First Class with Distinction

Medium of Instruction: The medium of instruction and examination (written and viva) shall be English. The expenditure on Field Work, Industry Exposure and Project Report shall be incurred by the student concerned.

Semester–end Examination	Subject Code / Course No.	Method of evaluation and Examination
Semester - I	1.1 to 1.6	Written Papers of 3 hours duration with 80 marks each at Semester – end examination conducted by the University
	1.7	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No.1.3.
Semester - II	2.1 to 2.6	Written Papers of 3 hours duration with 80 marks each

		at Semester – end examination conducted by the University
	2.7	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No.2.3.
Semester - III	3.1 to 3.6	Written Papers of 3 hours duration with 80 marks each at Semester – end examination conducted by the University
	3.7	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No..3.2 & 3.3
Semester - IV	4.1 to 4.6	Written Papers of 3 hours duration with 80 marks each at Semester – end examination conducted by the University
	4.7	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No.4.3 & 4.5
Semester - V	5.1 to 5.5	Written Papers of 3 hours duration with 80 marks each at Semester – end examination conducted by the University
	5.6	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No.5.1
	5.7	In this Student is expected to develop the software using in platform Evaluation based on project carrying 100 marks, evaluated by the Department in association with industry professionals.
Semester - VI	6.1 to 6.5	Written Papers of 3 hours duration with 80 marks each at Semester – end examination conducted by the University
	6.6	Practical and viva examination carrying 100 marks conducted by the Department in association with Industry. Practical will be conducted on basis of Course No.2.3, 3.2, 4.3, 4.5, & 5.1.
	6.7	In this Student is expected to develop the software using in platform Evaluation based on project carrying 100 marks, evaluated by the Department in association with industry professionals.

Programme structure:

The Semester wise structure of the programme shall be as follows:

BCA Part I:

Semester I	Semester II
1.1 Fundamentals of Information Technology	2.1 Digital Computer Design and Computer Organization
1.2 Algorithms and Programme Design	2.2 System Analysis and Design
1.3 Office Automation	2.3 C-Programming and Data Structure
1.4 Business Organization and Systems	2.4 Organizational Behaviour
1.5 Environment Studies	2.5 Business Environment
1.6 Mathematical Foundations	2.6 Numerical Methods
1.7 Computer Laboratory-I	2.7 Computer Laboratory-II

BCA Part II:

Semester III	Semester IV
3.1 Computer Architecture and Operating System.	4.1 Software Engineering.
3.2 Object Oriented Programming with C++	4.2 Data Communication and Networking
3.3 Database Design	4.3 Business Information System & Oracle
3.4 Management Accounting and Control	4.4 Marketing Management
3.5 Human Resource Management	4.5 Visual Programming
3.6 Computer Oriented Decision Models	4.6 Computer Oriented Statistical Methods
3.7 Computer Laboratory - III	4.1 Computer Laboratory – IV

BCA. Part III:

Semester V	Semester VI
5.1 Web Design & Internet Programming	6.1 E-commerce Applications
5-2 Multimedia Management.	6.2 Microcomputer and Maintenance
5.3 Advanced Networking	6.3 IT Enabled Services
5.4 Project Management	6.4 Communication and Personality Development
5.5 Information System Audit	6.5 Information System Audit-II
5.6 Computer Laboratory V	6.6 Computer Laboratory-VI
5.7 Project – I	6.7 Project – II

SYLLABUS

Course Code: 1.1

B.C.A. Sem – I

Fundamentals of Information Technology

1. Computer Basics and Data Representation:

Simple Model of Computer, Characteristics of Computer, Problem Solving Using Computers, Representation of Characters in Computers, Integers, Fractions, Hexadecimal Representation of Numbers, Decimal to Binary Conversion.

2. Input I Output Units and Computer Memory:

Description of Computer Input Units, Other Input Methods, Computer Output Units, Memory Cell, Organization, ROM, Serial Access Memory, Physical Devices Used to Construct Memories, Magnetic Hard Disk, Floppy Disk Drivers, CDROM, Magnetic Tape Driver.

3. Processor and Binary Arithmetic:

Structure of Instruction, Description of Processor, A Machine Language Program, An algorithms to simulate the hypothetical Computer, Binary addition, subtraction, multiplication, division, signed numbers, 2' complement representation numbers, addition / subtraction of 2' Floating-point representation of numbers.

4. Computer Languages and Operating System:

Why Programming Language Assembly language, Higher level programming language, Compiling high level language programme; some high level program languages, Need of operating system, Batch OS, Multiprogramming OS, Time Sharing OS, Personal Computer OS, Unix as, Micro kernel based OS, On-Line and Real Time System.

5. Computer Generations and Classification:

First; Second, Third, Fourth Generation of Computer, Moore's Law, Classification of Computers, Distributed Computer System, Parallel Computers

6. File Organization:

Concept of file, File organization and accessing techniques-Indexed, Line sequential, Hashed, File handling functions: Sorting, Merging, Indexing, Updating.

Reference:

1. Fundamentals of Computers: V. Rajaraman
2. Computers Fundamentals: P.K. Sinha

Course Code: 1.2

Algorithms and Program Design

1. Concept, of Problem, Procedure and Algorithm, Algorithm Representation through Pseudo - Code and Flow - Charts, Tracing of Algorithms Such as Swapping, Counting, Finding the Sum, Product, maximum, minimum, of a list of numbers.
2. **Design of Algorithm:**
Design of algorithm for problem such as Evaluation of polynomial, Sum of first n factorials, Finding n^{th} term of Fibonacci sequence, Finding largest and second largest of list, Determining n^{th} root of a number, compute, GCD and Base Conversion.
3. **Concept of Array, Sort and Search Technique:** Introduction of Array, Array manipulation such as removing the duplicates, Partitioning of an array, listing of prime numbers, finding prime factor of a number, The problem of search and Merge, Linear

Binary search algorithms, The Problem of Sorting, Selection, Insertion. Bubble.

4. Concept of Structured Programming and Procedure Oriented Programming:

Introduction, Concept, Basic Control Structure, Benefits of Structured Programming and Procedure Oriented Programming

5. Introduction to 'C' Language:

Scope, feature, objectives and application areas, Variables, Operators, expression, control structure.

6. Functions, Array and Pointer:

Introductions, Function with arguments, call by value; call by reference, declaration of array, array operation. Introduction to Pointers

Reference:

1. How to Solve it by Computers: Dromey R.G.
2. C-Programming: Balguruswami.

Course Code: 1.3

Office Automation

1. Data Processing:

- a) Data input, manipulation, information.
- b) Files and records
- c) File creation, access, manipulation and maintenance
- d) File Organization.

2. Operating Environment (WINDOWS):

- a) Features of MS-WINDOWS: GUI, multitasking etc;
- b) Main modules of Windows Q.S. Program manager, File manager, Print manager, Control panel; Networks
- c) Elements of Windows: Desktop, windows, application, icons, group window
- d) Switching between applications, running MS-DOS applications, window help
- e) Windows accessories: Write, Notepad, Paintbrush etc.

- f) Networking environment: Concept of Internet, Intranet, their uses and benefits.

3. Editors and word processors:

- a) Basic concepts
- b) Commands.
- c) Examples: NE, Wordstar, MS-WORD, VI
- d) Introduction to Desk Top Publishing, Indian language word processors

4. Spreadsheet and Database Packages:

- a) Purpose usage
- b) Elementary Commands
- c) MS EXCEL
- d) Creation and manipulation of files in MS ACCESS.

Reference:

1. Computers-Today: S. Basendra
2. Fundamentals of Computers: V. Rajaraman
3. Computer and Common Sense R. Hunt and Shelly

Course Code: 1.4

Business Organization and System

1. Business around us - understanding Business System. - Inside the world of Business National and International Business - Trends in business world.
2. Indian Business through ages - the pre-colonial era- the colonial period-Modern Business enterprise in India -Globalization and Challenges for Indian Business in the new millennium.
3. Nature and types of Business Sectors- Goods Producing Sector - Manufacturing - Construction-Mining Agriculture services sector: Wholesale and Retail - Finance & Insurance- Transportation & Utilities Other Services.
4. Forms of Business Organization: Sole Proprietorships – Partnerships- Jt. Stock Companies-Relative merits and demerits of each form.
5. Merges and acquisitions – Meaning – Importance - Legal, economic and

business aspects-economics of scale - types of Merges and combinations - Study of recent acquisitions and Mergers in India.

7. Small Scale Business: Importance and scope of SSBs in India - Economic role of SSI in India - Franchise business - advantages of franchising - Problems and Prospects of SSI in India.

Reference:

1. Ferrel, Hirt: Business, Houghton Mifflin Co. Boston
2. S.A. Sherlekar: Modern Business Organization, Himalaya
3. FICCI: Indian Business Through the Ages, Oxford University Press

Course Code: 1.5
Environmental Studies

1. The multidisciplinary nature of environmental studies – Definition, scope and importance, Need for public awareness.
2. Natural Resources:
 - a) Renewable and non-renewable resources:
Forest resources: Use and over-exploitation, deforestation, case studies.
Timber extraction, mining, dams and their effects on forests 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 foods 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 nonrenewable and energy Sources, use of alternate energy sources.
 - f) Land resources; land as a resources, land degradation; man induced landslides, desertification.

- Role of an individual in conservation of natural sources
 - Equitable use of resources for sustainable lifestyles
3. 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, Forest ecosystem, Grassland ecosystem, Desert ecosystem, Aquatic ecosystems [ponds, Streams, lakes, rivers, estuaries].
 4. Biodiversity and its conservation - Introduction; Definition: genetic, species and ecosystem diversity, Biogeographically classification of India, Value of biodiversity: consumptive use, productive use, social, ethical, aesthetic and option values, 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.
- 5. Environmental Pollution:**
- Definition:**
- Causes, effects and control measures of: 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 waster.
 - Role of an individual in prevention of pollution
 - Pollution case studies
 - Disaster management: floods, earthquake, cyclone and landslides
6. 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, Environment ethics: Issues and possible solutions, Wasteland reclamation, Consumerism and waste products, Environment protection Act.

- Air (presentation 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. 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
- Case Studies

8. **Field work:**

- Visit to a local area to document environment 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

Course Code: 1.6

Mathematical Foundation

1. Set Theory:

Introduction, Sets and Elements, Universal sets and Empty Set, Subset, Venn Diagrams, Set Operations, Algebra of Sets and Duality, Finite Sets, Counting Principles, Classes of sets, Power Sets, Partitions, Mathematical Induction.

2. Functions and Algorithms:

Introduction, Functions, One-to-One, and Invertible Functions, Mathematical Function, Exponential and logarithmic functions, Sequences, Indexed Classes of Sets, Recursively Defined Functions, Cardinality, Algorithms and Functions, Complexity of Algorithms.

3. Logic and Propositional Calculus:

Introduction, Propositions, Basic Logic Operations, Proposition and Truth Tables, Tautologies and Biconditional Statements, Arguments, Logical Implication, Propositional Functions, Quantifiers, Negation of Quantified Statement.

4. Vectors and Matrices:

Introduction, Vector, Matrices, Matrix addition Multiplication, Scalar Multiplication, Transpose, Square Matrices, Nonsingular Matrices, inverse, Determinants, Elementary Row Operations, Boolean Matrices

5. Counting:

Basic Counting Principle, Factorial Notation, Binomial Coefficients, Permutations, Combinations, The Pigeonhole Principle, The Inclusion - Exclusion Principle, Ordered and Unordered Partitions

6. Probability Theory:

Sample Space and Events, Finite Probability spaces, Conditional Probability, Independent Events, Independent Repeated trials, Binomial Distribution, Random Variables.

7. Properties of Integers:

Order and Inequalities, Absolute Value, Mathematical Induction, Division Algorithms, Divisibility, Primes, GCD, Euclidean Algorithm, Fundamental Theorem of Arithmetic, Congruence Relationship and Equations.

Reference:

1. Discrete Mathematics: Schaum's Series.

B.C.A. Sem-II

Course Code: 2.1

Digital Computer Design and Computer Organization

1. Digital Logic; Circuits:

Digital computers, logic gates, Boolean algebra; Complement of function, map simplification, combinational circuits, flip-flops, sequential circuits.

2. Digital Components:

Integrated circuits, decoders, multiplexers, registers, shift registers, binary counters, memory unit.

3. Register Transfer and Micro-operations:

Register transfer language; register transfer, bus and memory transfer, arithmetic Micro-operations, logic micro-operations, shift micro-operations, arithmetic logic shift unit.

4. Basic Computer Organization and Design:

Introduction codes, computer registers, computer instructions, timing and control, instruction cycle, memory reference instructions, input and output and interrupt, complete computer description, design basic computer; design of accumulator.

5. Programming the Basic Computer:

Introduction, machine language, assembly language, assembler, program loops, programming the arithmetic and logic, subroutines, input output programming.

Reference:

1. Computer System Architecture: M.M. Mano
2. Digital Logic and Computer Design: M.M. Mana
3. Digital Design: M.M. Mano
4. Computer Organization and Architecture: W. Stallings

Course Code: 2.2

System Analysis and Design

1. Introduction to system concepts:

Introduction to System, characteristic, elements of system, types of system, categories of information system

2. General phases of system development life cycle:

SDLC, waterfall model, prototyping model, spiral model and 4GT, system analysis

3. Requirement and Structured Analysis:

Feasibility Study, Fact-finding techniques, Decision Tree and Decision Table Pseudocode, Structured English, DFD

4. Database Design and Documentation Techniques:

ERD, System Flow Charts; Functional Decomposition Diagram; Structured Flow-Charts

5. User Interface Design:

Interface Design Dialogue, Strategies, Screen Management.

Reference:

1. System Analysis and Design: Awad
2. System Analysis and Design: Senn
3. Software Engineering a Practioner's Approach: Roger S. Pressman

Course Code: 2.3

C-Programming and Data Structures

1. Introduction of Procedure Oriented Languages:

Introduction, Pointers, Arrays, Pointers and Arrays Pointers to Functions, Introduction, Recursion, Character String handling, Storage Classes, Two-dimensional Arrays and pointer

2. Structures and Unions:

Declaration, Arrays of Structures, Pointers to Structure, Structure within Structure, Union Dynamic Memory Allocation and Memory Functions

3. Input-Output:

Standard input - output function, Disk input - output function, formatted input-output, File handling.

4. Data Structure:

ADT, Stack, Queue, Linked List

5. Stacks:

Concept, definition, operations, Implementation, declaration, functions, applications

6. Queue:

Concept, definition, types, operations, Implementation, declaration, functions, applications, Priority queues, multiple queues

7. Linked List:

Concept, definition, types, operations, Implementation, stack and queue using link list.

8. Trees:

Terminology, representation of binary trees, tree traversals, BFS, DFS, adding, deleting and searching an element in a tree; Extended binary tree.

Reference:

1. C-Programming: Balguruswamy
2. Data Structures: Horitz and Sahani

Course Code: 2.4

Course Name: Organization Behavior

1. Nature, Scope, Objectives of Organisational Behavior.
Human Behaviour: Behaviour, Attitude, Values- O.B. Concept. O.B. Models – Autocratic, Custodial, Supportive, Collegial Models, Decision Models, SOBC Models, Philosophical Concepts under O.B. Interpersonal Relationships Perception Models.
 - Group: Types of Groups, Group Decision – Making Process, Group Dynamics. Group Meetings and Conferences.
2. Motivation: Meaning, Importance. Motivation Process. Techniques. Theories of Work Motivation- Achievement Motivation. Douglas Mc Gregor's Theory X and Theory Y. Abraham Maslow's Hierarchy of Needs.
3. Stress Management: Concept of Stress, Burnout, Sources of Stress, III effects of Stress. Strategies to overcome Individual Vs Organizational Stress, Strategies of Good Health.
4. Leadership: Meaning Its Importance to the Organization. Manager as a Leader. Leader Vs Boss. Leadership Styles. Models.
5. Personality: Models. Assessment of Personality. Personality Traits. Theories of Personality.
Conflict Management: Traditional Vs Present Views, Conflict Process. Interpersonal, Intrapersonal conflicts. Strategies to overcome Conflicts. Traditional Analysis.
Organization : Emerging Trends, Climate, Culture, TQM etc,
6. Case – Studies Based on Contemporary Scenario
Books :
 1. K. Aswathappa ; Organization Behaviour
 2. Uma Sekaran : Organization Behaviour
 - 3 Dr S W Deshpande : Handbook of Organization Behaviour
 4. Stephan Robbins: Organization Behaviour

Course Code: 2.5
Business Environment

1. Concepts and Significance of Business Environment
2. Nature, Scope, Characteristics of Business - Covering A) Population, B) Agriculture, C) Industry, D) Trade, E) Transport, F) Banking and Financial Institutions, G) Insurance.
3. Business Environment Scenario During Post- Independence Period.
4. Relationship Between Business and National Economy. Business Environment and Economic Reforms. Introduction to Highlights of Second Generation Reforms
5. Introduction to Macro-Economics Policies, Fiscal Policies, Monetary Policies, Export - Import Trade Policies, Labour Taxation. Public Expenditure
6. Political Stability and Business and Economic Environment. International Situation and its Effects on Business Environment. India and World Economic and Trade organizations

Reference:

1. Business Policies and Strategies: Dr. B.S.K.S. Chopra
2. Indian Economy: A. N. Agarwal
3. Indian Economy: Dutta and Sundaram

Course Code: 2.6

Computer Oriented Numerical Methods

1. Introduction to Numerical Computing, Computers and Computer concepts
2. Computer Codes and Arithmetic
3. Approximations and Errors in Computing
4. Floating Point Computation-Polynomial Interpolation.
5. Numerical Differential and Integration Ordinary Differential Equations
6. Systems of Linear Equations, Root finding, Curve fitting

Reference:

1. Elementary Numerical Computing: Robert Skeel
2. Numerical Methods: Balgurusamy
3. Elementary Numerical Analysis: Samuel D. Conte.

B.C.A. Sem - III

Course code: 3.1

Computer Architecture and Operating System

1. **Central Processing Unit:** Hardwired and micro programmed CU, Controlled Memory, address, sequencing, microprogramming examples, design of control unit, CPU-control register organization, stack organization.
2. **Micro Instructions:** Instruction formats, addressing modes, data transfer and manipulation, program control, CICS and RISC characteristics.
3. **Input / Output Organization:** Peripheral devices, Input Output- interface, Asynchronous data transfer, modes of data transfer, Priority interrupt, DMA, IOP, Serial communication.
4. **Memory Organization:** Hierarchy, Virtual memory, Associative and cache memories, memory management hardware.
5. **Introduction:** Evolution of operating systems, Types of operating systems, Different views of the operating system., operation system concepts and structure.
6. **Process:** The process concept, systems programmer's view of processes. The operating system services for process management scheduling algorithms. Performance evaluation.
7. **Memory Management:** Memory management without swapping or paging, swapping, virtual memory, page replacement algorithms, modeling-paging algorithms, design issues for paging systems, segmentation.
8. **Inter-process Communication and Synchronization:** The need for inter-process synchronization mutual exclusion semaphores, hardware sport for mutual exclusion, queuing implementation of semaphores; classical, problems in concurrent, programming, critical, region and conditional, critical region, monitors, messages, deadlocks. Introduction to File System and IO

Textbooks:

1. Computer System Architecture: M. Moms Mano, PHI (1993)
2. Operating System Concepts: Peterson J. L., Abraham Silberschatz

Course Code: 3.2

Object Oriented Programming with C++

- 1. Introduction:** Difference between Structured Programming and Object Oriented Programming The Object Oriented Approach, Characteristics of Object - Oriented Languages – Classes, Objects, Encapsulation, Inheritance, Polymorphism; C++ and C.
- 2. Functions:** Simple Functions, Passing Arguments to Functions, Returning Values From Functions, Reference Arguments, Overloaded Functions, Address of an overloaded function, passing an address of an overloaded function as an argument to another function, Inline Functions, Default Arguments, Variables and Storage Classes. The Delete and New Operator, Difference Between Pointers and References.
- 3. Objects and Classes:** A simple class, Difference between class, structure and union in C++, C++ Objects, Constructors and Destructors, Concept of an ADT, Constant member function, Objects as Function Arguments, Returning Objects From Functions, Classes, Objects and Memory, Static Class Data, Pointers to Object, An Array of Pointers to Objects.
- 4. Operator Overloading:** Introduction, Overloading, Unary, and Binary Operators, Concatenating Strings, Comparison Operators, Arithmetic Assignments Operators, Data Conversion Between Basic Types, Between Objects, and Basic Types, When to Use What.
- 5. Inheritance:** Derived Class and Base Class, Derived Class Constructors, Class Hierarchies, Public and Private Inheritance, Multiple Inheritance, Containership - Classes within Classes, Inheritance and Program Development.
- 6. Virtual Functions and Other Subtleties:** Virtual Functions, Pure Virtual Functions, Friend Functions, Static Functions, Assignments and Copy Initialization, The Copy Constructor, The this Pointer, Abstract classes.
- 7. Files and Streams:** streams, string I/O; file pointers

Books Recommended:

1. Object-Oriented Programming in turbo C++ by Robert Lafore;
2. Object-Oriented Programming with C++ by E. Balguruswamy.

Course Code: 3.3 Data Base Design

Objectives:

This paper deals with introduction to database architecture components. various models, Besides, it also covers database design through E-R Diagram, normalization and its implementation through Fourth Generation language viz. MS-Access

1. **Introduction:** Basic concepts, advantages of DBMS over file processing system, role of DBMS, database architecture and data independence, data base users, database abstraction, schemas and instances, database language and interfaces, life cycle of DBMS applications, database models.
2. **Data Modeling Techniques:** Basic concepts, type of data models, introduction E-R diagram, hierarchical, networking and relational database model and their relative advantages and disadvantages, products, comparisons Relational Database Introduction; Codd's 12 Rules; Concept of Domain Tuple, cardinality; comparison between HDB-NDB-RDB.
3. **Normalization:** Advantages and disadvantages of normalization, functional dependencies and normalization of relational database, normalization form on primary keys, 1NF-2NF-3NF-BCNF rules with examples, loss less join and dependency preserving decomposition.
4. Introduction to Object Oriented Database Design, Object Oriented E-R Diagram, Cases.
5. Concurrency Control: Problems of concurrent Transactions: Control Mechanisms such as Locks, Time-stamps, Optimistic. Scheduling and MVT, Granularity
6. Recovery Mechanisms Recovery from various problems of volatiles and non-volatiles storage devices: Concept-properties-states of Transaction, Introduction to mechanisms such as-Log Checkpoint and Shadow Paging.
7. Distributed Databases: Concepts, Data Distributions Techniques
8. Concepts Object Oriented Database Management Systems: Table, Object type, Nested table, comparison of C++ class with Oracle database Design.

Textbooks:

1. Data Base System Concept by Korth.
2. Database Management Systems by Nawathe

Reference books:

1. Principals of Database Management by James Martin
2. Computer Database Organization by James Martin
3. Relational Database Design for Micro Computers Application - Prentice Hall (Jackson).

Course Code: 3.4**Management Accounting & Control****Unit 1: Financial Accounting:**

1. Accounting concepts, Accounting conventions, Double entry book keeping and recording of transactions.
2. Preparation of journal, Ledger Accounts and Trial Balance, Trading and Profit and Loss Account and Balance Sheet, adjustment entries for the proprietary firm
3. Methods of Depreciation and accounting of depreciation (SLM and WDV)

Unit 2: Cost Accounting:

1. Meaning and, definition of Cost; Classification and Types of Costs, Elements of Costs.
2. Allocation, Appointment and Absorption of costs with simple problems;
3. Variance Analysis - Materials and Labour, Budgetary Control, Marginal. Costing-Break even Analysis, PV Ratio, MS (for all simple problems)

Unit 3: Management Accounting:

1. Definition, Distinction between Cost Accounting and Financial Accounting, Advantage and Applications and Techniques. Objectives scope, and functions of Management Accounting
2. Ratio Analysis - Introduction and Comparison of Financial Performance by using simple ratios with simple problems.

Books:

1. Accounting and Financial Management: Prasad R. D., Himalaya Publishing House.
2. Accounting for Management: Bhattacharya S. V., Dearden J., Vikas Publisher.
3. Cost Accounting: Banerjee S. - Macmillan India Ltd.
4. Cost Management Accounting: S. M. Inamdar, Everest Publishing House.
5. Management Accounting: Prof. Mahesh Kulkarni, Career Publication.

Course Code: 3.5**Human Resource Management**

1. Introduction to Management: Principles of Management, Evolution of Management - Theories of Management.
2. Introduction to Human Resource Management - Meaning, purpose and objective of HRM, Function of HRM, Functions of HR Manager.
3. Human Resource Planning: Job Analysis, HR' planning, Recruitment, Selection - Process, types of selection tests types of interviews, induction, placement.
4. Wage and Salary Administration: Job evaluation, Concept of Wages, Wage fixation, factors of wage determination.
5. Employee Development: Training: Training need analysis; Types of training methods, evaluation of training.
6. Employee Relation: Concept of Industrial Relation; Meaning, elements, Industrial disputes, Grievances, Disciplinary Actions.

Reference:

1. Human Resource Management text and cases – VSP Rao (Excel Publications)
2. Human Resource Management and Personnel Management text and cases – K. Ashwathappa (Tata McGraw Hill)
3. Essentials of Human Resource Management, Text and cases – P. Subaa Rao (Himalaya Publications)

Course Code: 3.6

Computer Oriented Decision Models

1. Operations Research:

Introduction to Operations Research, Model in Operations Research
Applications and Limitations of Operations Research

2. Decision Making:

Decision making process, types of decision models, Advantages and
Limitations of Decision Models, Decision Trees – preliminary idea.

3. Linear Programming Problem:

Introduction to Linear Programming Problem, Components of Linear
Programming Problem, Formulation of Linear Programming Problem,
Applications and Limitations of Linear Programming, Problem

4. Solution of Linear Programming Problem:

A. Graphical Solution Methods and Special Cases.

B. Simplex Method- Introduction to Simplex.

5. Transportation Problem:

Definition, Application, Solution of Transportation Problem, Initial Basic
Feasible Solution (NW, ROMI, VAM, MATRIXMINIMA, COLUMNMINIMA
method), Modi Method, Special cases, unbalanced Transportation Problem,
Restricted Transportation Problem, Transportation Problem for maximization,
Degeneracy in Transportation Problem.

6. Assignment Problem:

A. Definition, Applications & Solutions by Hungarian Method

B. Job Sequence Problem.

7. Network Analysis:

Introduction, Applications & Importance PERT & CPM Analysis

8. Simulation:

Introduction, Importance and uses of simulation technique, Monte Carlo
Method

Books:

1. Operations Research: by TAHA
2. Operations Research: by Anand Saxena

3. Operations Research: by Hira Gupta

B.C.A. Sem - IV

Course Code: 4.1

Software Engineering

Objectives:

This course aims to give students a theoretical foundation in software engineering. In this students will learn about the principles and methods of software engineering, including current and emerging, software engineering practices and support tools. Because this is a writing component course there will be heavy emphasis on written communication skills.

- **Software Engineering:** What is Software? Software Categories, Characteristics of Software, Principles of software engineering, Difference between Software Engineering and Programming.
- **Software Process:** The waterfall model; Prototype Model, Spiral Model, RAD Model
- **Teamwork:** Members involved in Software Development, Organizing the team, Qualities required for a Team Leader.
- **System Analyst:** Skill set required by Systems analyst like Analytical Skills, Technical Skills, Management Skills, Interpersonal Skills.
- **Software requirements:** Requirement Gathering Process, Traditional Methods for Requirement Gathering, Modern Methods for Determining System Requirements.
- **Structuring Systems Requirements:**
Process Modeling, Data flow diagramming mechanism.
Logic Modeling, Structured English, Decision Tables, Decision Trees
Conceptual Data Modeling, E-R Model
- **Software Design:**
Architecture Design, Types of Architectures
User Interface Design, Golden Rules for User Interface Design

- **Testing** (Introduction to testing in short)
White Box Testing Techniques
Black Box Testing Techniques

Reference:

1. Modem System Analysis and Design, 3rd ed., J. Hoffer, J. George, Valachich, Pearson Education (ISBN: 81, 7808-781-2).
2. Software Engineering: A Practitioners Approach, 5th ed., Roger Pressman, Tata McGraw Hill.

Course Code: 4.2

Data Communication and Networking

1. **Introduction to Computer Network:** Advantages of networks, structure of the data communications network, point-to-point and multi-drop circuits; data flow and physical circuits, network topologies, topologies and design goals. Hierarchical topology, horizontal topology (Bus), star topology, ring topology, mesh topology. Switched and non-switched options, fundamentals of communications theory, analog and digital transmission channel, speed and bit rate, bandwidth and, the frequency, digital signals, the modem, asynchronous and synchronous transmission.
2. **LAN, MAN, WAN:** Connection oriented and connectionless networks, classification of communications protocols, time division multiple access (TDMA), time division multiplexing (TDM), carrier sense (Collision) system, token passing, peer-to-peer priority systems, priority slot, carrier sense (collision free) system, token passing (priority) systems.
3. **Layered Protocols and the OSI Model:** Goals of Layered Protocols, network, design problems, communication between layers, introduction to standard organizations and the OSI model, Layers of OSI.
4. **Polling / Selection Protocols:** Character and bit protocols, binary synchronous control (BSC), HDLC, HDLC options, HDLC frame format, code transparency and synchronization, HDLC transmission process, HDLC subsets, SDLC,

Protocol conversion.

5. **Local Area Network:** IEEE LAN standards, relationship of the 802 standards to the ISO, LAN topologies and protocols, CSMA/CD and IEEE 802.2, token ring (Priority), token bus and IEEE 802.4.
6. **Switching and Routing in Networks:** Message switching, packet switching, when and when not to use packet switching, packet routing, packet switching support to circuit switching networks.
7. **The X.25 Network and Supporting Protocols:** Features of X.25, Layers of X.25 and the Physical layer, X.25 and the data link layer, companion standards to X.25, features of X.25, Frame relay.
8. **TCP/IP:** TCP/IP and internetworking, example of TCP/IP operations, related protocols ports and sockets. The IP, address structure, major features of IP, IP datagram Major IP services. IP source routing, TCP, Major features of TCP, passive and active operation, the transmission control block (TCB), route discovery protocols, examples of route discovery protocols, application layer protocols.

Text Books:

Computer Networks - U. Black

References:

Computer Communication Network -W. Stallings,

Computer Networks - Tannenbaum A. S

Course Code: 4.3

Business Information System & Oracle

Business Information System

- 1. Introduction:** Need, purpose, objective, plan, place in organization, concept, design, models. Concept under MIS: Decision making, principles and process of decision making, decision tree, decision table, payoff-nature; principle of rationality, utility, Risk and its application in decision making, Herbert Suman Model and law of Requisite Variety management of Risk and decision making.
- 2. Information Concepts:** Data Vs. Information Relevance of information to decision making, source of type of information, quality of information, perfect information and value of additional information, information modeling with reference to its users and processes. Application of communication model and concept of human as information processes, Reference of information in MIS Systems: Definition, types, Use of control principles in system design, open-closed deterministic and probabilistic systems, Use of feedback principle for control, Methods of handling complex systems.
Relevance of choice of systems in MIS
Integration of organization systems and information systems
- 3. Organization:** Structure and types of organizations, decision making and information flow in organizations, dynamics of organization, behaviors, cultures, attitudes and management systems.

Oracle

- Overview of RDBMS
- Data model: Overview of Hierarchical model, Network, Relational, Object relational
- Codd's rules
- Introduction to Oracle Architecture, Process (Background list)
- Overview with Tools of Oracle: Sql * plus, PL/SQL, Forms, Reports Pre-compilers (SQL Loader, Import, Export)
- Introduction to SQL: DDL, DML, DTL (TCL)

- Data types
- Character: Char, Varchar/varchar2, Long, Number
Column-name number
Column-name number (p) - fixed point
Column-name number (p,s) - floating point
- Data date type, Raw data type, Long raw data type
- LOB data type, CLOB, BLOB, BFILE
- Table: Constraint Definition, Domain; Entity, Referential
Create table, Drop table, Normalization (Applied)
- Commands and clause
Insert, update, delete, with 'where' clause
- Queries and SQL functions
Select with all options
Operations and operators
Arithmetic Comparison Logical
In, not in, between, like, all, not like, %, any, exists, not exists, is null, is not null, and, or, not
Query Expression Operators
Union, intersect, minus
- Operators Precedence
- SQL Functions
Date: Sys_date, new_time, next_day, Add_months, last_day, months_between
Numeric: round, trunc, abs, cell, cos, exp, floor
Character: initcap, lower, upper, trim, translate, length, char
Conversion: to_char, to_date, to_number
Miscellaneous: Uid, User, nvl;vsize
- Group function
avg, max, min, sum, count
Group by clause
Having clause
- Expression (Set operations: join)
- Set Operations
Union, union all, intersect, minus

- Relating data through join concept
Join Theory
- Simple join
- Equi join
- Non equi join
Self join, Outer join
Table aliases
- Query and sub queries
Case should be thought / example
- Introduction to object oriented database
Concept; object binding in oracle, class, attribute, methods
- Object type
Definition, declaring and initializing
Methods, after and drop type
- Views and synonyms
- Synonym
Introduction,
Object type
 User definition with example
 Create, synonym as alias for table and view, drop
- Sequence
Introduction, creates with option, alter sequence, drop view
Intro, creates, update, drop, index, introduction, create
- Locks in oracle (Conceptual)
Concept of locking
Types of lock
Row level (select... for update clause)
Table level - Mode
Share, share update, exclusive, nowhere, deadlock
Primary Introduction to DBA
User create, granting
Privileges
Object, system user

(GRANT, REVOKE, COMMIT, ROLLBACK, SAVE POINT)

report writer using SQL

- Title, Btitle, skip, set pause, column, SQL.pno, breake on, computer sum, set serveroutput on

PL/SQL

- Introduction to PL/SQL
- Advantage of PL/SQL: Support for SQL, Higher productivity, Better performance
Portability, Integration with Oracle
- PL/SQL Character set
- Data types: Character, Raw, Boolean, binary_integer, number
- Variable, constant
PL/SQL blocks
- Attribute
%type, %rowtype
operators function comparison numeric, character, date
- Control structure
Condition - if
Interactive - loop, for, while
Sequential -goto
- Cursor management
Static cursor, dynamic cursor, explicit & implicit cursor
Cursor for loop, Parametric cursor

Course Code: 4.4
Marketing Management

1. Historical origin of concept of Marketing, Marketing Vs Selling, Modern concept of Marketing - Consumer Delight-High-tech marketing concept.
2. Market segmentation-Bases- Targeted Customers.
3. Marketing Strategy - Formulation Process, Types of marketing strategies-Marketing, Mix: its components.
4. Product Mix: Branding, Packaging Strategies - Product related strategies or 'IT' Market
5. Marketing Research – Process - Applications.
6. Marketing Plan- components process - Marketing control - process, limitations, marketing plan control relationship.
7. C.R.M. in Practice
8. Case studies

Books References:

1. Marketing Management - Dr. Philip Kotler
2. Marketing: Managerial Approach: Dr. J. C. Gandhi
3. Marketing Management - Indian Context - Ramaswamy Nandkumari
4. Marketing Management - Dr. Rustum Dawar
5. Marketing Management - Text& Cases: Prof. M. D.Kakade

Course Code: 4.5

Visual Programming

1. Introduction to Visual Basic
 - 1.1 Event Driven Programming.
 - 1.2 Starting and Exiting VB.
 - 1.3 Understand VB Environment.
 - 1.4 Project Explorer.
 - 1.5 Properties Window.
 - 1.6 Toolbox.
 - 1.7 Form Layout Window.
 - 1.8 Property Pages.
 - 1.9 Getting Help.
 - 1.10 Saving Project.
 - 1.11 Printing Projects.
 - 1.12 Running Applications.
2. Adding Code and Events
 - 2.1 Code Window
 - 2.2 Naming Conventions
 - 2.3 Variables (all data types): Byte, Boolean, Integer, Long (long integer), Single (single precision floating Point), Double (double precision floating-point), Currency (scaled integer) Decimal, Date, Object, String (variable-length), String, (fixed, length), Variant (with numbers), Variant (with characters), User-defined (using Type).
 - 2.4 Scope (Global, Local, Static)
 - 2.5 Constants
3. Visual Basic Controls
 - 3.1 Label Control
 - 3.2 Textbox Control
 - 3.3 Command Button Control
 - 3.4 Frame Control
 - 3.5 Checkbox Control
 - 3.6 Option Button Controls

- 3.7 Listbox and Combo Box Controls
- 3.8 Tab Order
- 4. Working with Functions
 - 4.1 String Functions
 - 4.2 Mathematical Functions
 - 4.3 Date Functions
 - 4.4 Data type conversion Functions,
- 5. Control Statements
 - 5.1 IF Statements
 - 5.2 Select Case Statement.
 - 5.3 Do Statement.
 - 5.4 For Statement.
 - 5.5 Exit Statement.
- 6. Dialog Boxes.
 - 6.1 MsgBox.
 - 6.2 Inputbox.
 - 6.3 Common Dialog Box (Microsoft Common Dialog Control 6.0)
- 7. Menus.
 - 7.1 Creating Menus.
 - 7.2 Adding Code to Menus.
 - 7.3 Toolbars.
 - 7.4 Other Common Controls.
 - (Microsoft Windows Common Controls 6.0'
 - Microsoft Windows Common Controls-3 6.0)
- 8. Accessing Data.
 - 8.1 Reading and Writing Test Files.
 - 8.2 Visual Data Manager.
 - 8.3 Data Control.
 - 8.4 Data Grid Control, DB-Combo Box and DB-ListBox.
 - 8.5 SQL Queries in VB.
 - 8.6 Jet DAO.
 - 8.7 ADO (with control and code).
 - 8.8 Error Handling
 - 8.9 Reports.

Books Recommended:

1. Visual Basic 6.0 Programming by Hotzner Steven.
2. Visual Basic 6.0 in 21 days by Perpy Greg.
3. Peter Norton's Guide to Visual Basic 6.0 by Peter Norton
4. Visual Basic 6.0 by Peter Wright.

4.6: Computer Oriented Statistical Methods

1. Introduction to Statistical Methods:

Definition of Statistics, Need, Scope, Functions, Uses and Importance of Statistics

2. Collection of Organization Data:

Population and sample, Methods of sampling, Types of Data; Sources of Data, Primary and Secondary, Classification and Tabulation of Data

3. Presentation of Data:

Diagrammatical and Graphical Representation of Data

4. Measures of Central Tendency:

Mean, Median, Mode, GM, HM, Position Values, quartiles, deciles, and percentiles.

5. Measures of Dispersion:

Absolute & Relative Range, Quartile Deviation, Mean Absolute Deviation, Standard Deviation, variance, Coefficient of variation, Correlation, Types of Correlation, Methods of Studying, Scatter Diagram, Karl Pearson's Coefficient, Rank Coefficient

6. Times Series:

Components of Time Series

7. Regression Analysis:

Linear Regression Model, Regression Lines, Y on X and X on Y, Regression Coefficients, Properties of Regression Coefficients, Estimation of unknown values etc

Books:

1. Statistics: Sancheti and Kapoor
2. Fundamentals of Statistics: S.C. Gupta
3. Statistics: Concepts and Applications by Nabertdu Pal & Saheb Sarkar (EEE)
4. Statistics through EXCEL

Course Code: 5.1

Web Design and Internet Programming

1. **Overview of Internet:** Introduction to Internet and WWW, Concept of Networking and Layers of OSI Model, Internet protocols like TCP/IP, http, telnet and ftp, url, domain name, web browsers, search engine, various internet & web technologies, Hardware and Software requirement for different internet applications.
2. **Principles of Web Design:** Key issues to be considered in web site design.
3. **Structure of a Web Page:** Introduction to HTML, Elements of HTML syntax, Head of Body sections, Building HTML documents, Inserting text, images, hyperlinks, Backgrounds and colour control, ordered and unordered lists, content layout and presentation.
4. **HTML Tags:** Use of different HTML tags in web pages.
5. **Table Handling:** Table layout and presentation, constructing tables in a web page, developing a web page in a table.
6. **HTML Editors & Tools:** Use of different HTML editors and tools like Netscape Communicator and Microsoft Front Page etc.
7. **Graphical and Animation Techniques:** Use of Different graphical and animation tools like, Gift Animator, Dream Weaver, Flash etc.
8. **Frames:** Developing Web pages using frames.

Scripting Language:

Java, Script Programming - Dynamic HTML - Cascading style, sheets - concepts of Document Object Model, Event

Model- Filters and Transitions - ActiveX controls - Multimedia - Client side scripting

VB Script- Identifiers, operators, controlling, web browser object model, window object, pre-defined functions and event handling

Reference Books:

1. Rick Dranell, 'HTML4 unleashed', Techmedia Publication
2. Shelly Powers, , Dynamic Web Publishing Unleashed, Techmedia.
3. D. Norton and H. Schildt – Java Script, Vikas Publication.
4. D. Norton and H. Schildt - Java2: The Complete Reference - TMH 2000.
5. Deitel & Deitel, Internet & World Wild Web; How to program, Prentice Hall 2000.

Course Code: 5.2 **Multimedia Management**

1. Introduction:

Definitions, CD-ROM and the multimedia highway, CD-ROM and the multimedia

The Multimedia Highway

Where to use multimedia?

Multimedia in Business, schools, home, public places, Introduction to making Multimedia. The stages of the project, What you need - hardware, software, creativity and organization.

2. Multimedia Authoring Tools:

Types of authoring tools

The right tool for the job, Editing features, organizing features, programming features, interactivity features performance tuning features, playback features, delivery features, cross plat form features, internet playability.

Card and page based authoring tools, Icon based authoring tools, time based authoring tools.

3. Text:

Using text in multimedia, designing with text, choosing text fonts, menus for navigation, buttons for interaction; fields for reading HTML documents; Symbols and icons, animating text.

Computers and Text

The font wars, font foundries, managing your fonts, character sets and alphabets, mapping text, across platforms

Font editing and designing, tools

Res Edit, photographer, making pretty text

Hypemedia and Hypertext.

The power of hypertext, Using hypertext, searching for words, hypermedia structures, hypertext tools.

4. Sound:

The power of sound, Multimedia System sounds, MIDI versus Digital Audio, Choosing between MIDI and Digital Audio, Digital Audio, Preparing Digital Audio Files.

Audio File, Formats, Sound of the World Wide Web, Adding sound to your multimedia project

Production, Copy right Issues

5. Images:

Making still images, Bitmaps, Vector Drawing, 3-D, drawing and rendering colour. Understanding natural light and colour, computerized colour, colour palettes, image file formats, Macintosh Formats, Windows Formats, Cross-Platform formats.

6. Animation:

The power of motion Principles of Animation, Animation Techniques, Animation File Formats, Making Animation That Work, A Rolling Ball, A Bouncing Ball, Creating and Animated Scene

7. Multimedia Communications:

Introduction, multimedia information representation, multimedia networks, multimedia applications, media types, communication modes, network types; multipoint conferencing, network QOS application QOS

Reference books:

1. Multimedia Making It Work, 5th ed. By Tay Baughan – Tata McGraw Hill
2. Multimedia Communication: Applications, Networks, Protocols and Standards, Fred Halsall, Pearson Education, Asia, Second India Reprint 2002.
3. Multimedia Information Networking, Nalin K Sharda, PHI. 2003.

Course Code: 5.3

Advanced Networking

1. **Review of Network Technologies:** Two approaches to Network. Communication, WAN and LAN, Ethernet Technology, FDDI, Aynchronous transfer mode, WAN technologies, ARPANET, Internetworking Concept and Architectural Model, Application-Level Interconnection, Network-Level Interconnections, Properties of the Internet, Internal Architecture, and Interconnection through IP Routers.
2. **Internet addresses:** Universal identifiers, Classful addressing scheme, addresses specify Network Connection. Network and Directed Broadcast Addresses, limited broadcast, subnet and super net extensions, IP multicast address, weaknesses in Internet addressing, doted decimal notation, Loop back address.
3. **Mapping Internet Addresses to Physical Addresses (ARP):** The address resolution problem, two type of physical addresses, Resolution through direct mapping and dynamic binding, The address resolution cache, ARP cache timeout, ARP Refinements, Relationship of ARP protocol format.
4. **Determining an Internet Address at Startup (RARP):** Introduction, Reverse address resolution protocol (RARP), Timing RARP transactions, Primary and backup RARP servers.
5. **User data gram Protocol:** The user data gram protocol, format of UDP messages, UDP pseudo-header, UDP encapsulation and Protocol layering, Layering and the UDP Checksum Computation, UDP Multiplexing, Demultiplexing and Ports, Reserved and Available Port Numbers.
6. **Reliable Stream Transport Service (TCP):** The need for stream delivery,

Properties of the Reliable delivery service, Ports, connections and endpoints. TCP segment format, out of band data, maximum segment size option, TCP checksum computation, Acknowledgements and retransmission, Timeout and retransmission, Establishing a TCP connection, closing a TCP connection.

Reference books:

1. Internetworking with TCP/IP Principles, Protocols and Architecture, Vol-I, by Douglas E. Comer, 4th ed. 2001 Pearson Education Asia.
2. Gary R. and Richard Stevens, TCP/IP Illustrated, Vol-I and Vol-II, Addison

Course Code: 5.4

Project Management

1. Introduction to project management, scope of the project planning and management activity, Task and responsibilities of project manager / team members, typical software organizational structure.
2. Requirement Engineering, Problem, definition system analysis-requirement specifications and tractability estimation of project casting, Resources and schedules, continued chain projects management.
3. Risk Management: Classic mistakes, elements of risk management; risk identification, risk analysis, risk prioritization, risk control, risk, high risk and gambling, Impact analysis tools, (case study expected).
4. Detailed project definition: Project plan verification'- configuration management plan and change control-SQL plan.
5. Estimation: Cost estimation story, estimation process overview software metries, metries date collection, size estimation (Kloc, function points lecture points, 3-d function points) effort estimation, schedule estimation, ballpark schedule estimate, estimate requirement, empirical models, COCOMO-2 Application of metries.
6. Introduction to Advanced topics .in software Engineering software reuse Management issue, reuse process, domain engineering, building reusable components, classifying and retrieving components, economic of software reuse reengineering, restructuring. Forward engineering, economics of re engineering.

Reference books:

1. Pressman - Software Engineering
2. McConnell- Rapid development
3. Merline Derfman and Richard Thayer, Software Engineering
4. Kemerer - Software Project Management

Course Code: 5.5

Information System Audit- I

1. **Introduction** - Need for control and audit of computers, effects of computers on Internal Controls, Effects of computer on auditing, foundation of Information System Auditing.
2. **Conducting an Information System Audit** - The nature of controls, Audit risks; Types of Audit Procedures, Overview of Steps in an Audit, Auditing Around or Through the Computer.
3. **Management Control Framework** - Introduction, Top Management Control- Evaluating Planning, Organizing, Leading and Controlling function
4. **System Development Management Control** - Introduction, Approaches to Auditing System Development, Normative Models of the System Development Process, Evaluating the Major Phases in the System Development Process.
5. **Programming Management Controls** - Introduction, The Program Development Life Cycle, Organizing the Programmer Team. Managing System Programming Group.
6. **Data Resource Management Control** - Introduction, Motivations towards the DBA Roles, Functions of the DA and DBA, Data Repository Systems.
7. **Security Management Controls** - Introduction, Conducting a Security Program, Major Security Threats and Remedial Measures, Controls of Last Resorts.
8. **Operations. Management Controls** - Introduction, Computer Operations, Network Operations, Data Preparation and Entry, Production Control, File Library, Documentation and Program Library, Help Desk / Technical Support, Capacity Planning and Performance Monitoring, Management of

Outsourced Operations

9. **Quality Management Controls** - Introduction, Motivations Towards the QA Role, QA Functions, Organizational Considerations, Relationship between Quality Assurance and Auditing.

Reference Books:

1. System Audit, Revathy Sriram M., TMH.
2. EDP Auditing - Ron Webber - TMH.
3. CISA Material, Information System Audit and Control Association, USA.

B.C.A. Sem - VI

Course Code: 6.1

E-Commerce Applications

1. **E-Commerce Basics:** E-Commerce practice v/s traditional practices, Benefits of E-Commerce to organization, consumer and society, Limitations of E-Commerce
2. **Types of E-Commerce: B2C, B2B, C2C, P2P:**
Major Business to Consumer (B2C) Business Models: Portal, E-tailer, Content provider, Transaction Broker, Market Creator, Service Provider, Applications in B2C: E-Banking, E-Trading, E-Auction Major Business to Business B2B, Business Models, E-Distributor, B2B Service Provider, Benefits of B2B on procurement, Just in Time Delivery, Consumer- to Consumer (C2C) Business Models, Peer to Peer (P2P) Business Models
3. **E-Commerce Website:** Planning - The Systems development life cycle, System Analysis, Identify Business Objectives, System Functionality and Information requirements, System design Hardware and Software Platforms. Building the System - In-house Vs Outsourcing, Hosting, Testing the system, Implementations and Maintenance.
4. **Security and Encryption:** The E-Commerce Security Environment -

Dimensions of E-Commerce Security, Security Threats in the E-Commerce environment, Malicious Code, Hacking, Credit Card Fraud, Spoofing, Denial of Service (DoS) Attacks, Sniffing. Technology Solutions - Protecting Internet Communication, Encryption, Securing Channels of Communication, Secure Sockets layer (SSL), Protecting Networks, Firewalls and Proxy Server, Protecting Servers and Clients.

5. **Payment Systems:** Digital Wallets, Digital Cash, Online Stored Value System, Digital Accumulating, Balance Payment Systems, Digital Credit Card Payment Systems, Digital Cheque Payment Systems.

Reference books:

1. E-Commerce by Kenneth C. Landon and Carol Traver, Person.
2. E-Commerce: The Cutting, Edge of Business by Kamalesh Bajaj and Debjant-Nag, Tata McGraw Hill.
3. E-Commerce Strategy, Technology and Applications - by David Whiteley (TMGH Publishing)
4. E-Commerce Concepts Models and Strategies – by C.S.V. Murthy (Himalaya Publishing)
5. Network Security and Cryptography - Atul Kahate

Course Code: 6.2

Microcomputer and Maintenance

1. Microcomputer: Digital Computer-Block diagram, Bus structure, Microprocessor, Memory, I/O, CPU (In detail)
2. PC Mother Board: Introduction, Motherboard functions, Functional Units and Inter communication, Reset Logic, CPU Nucleus Logic, DMA Logic, Wait State Logic, RAM Logic, ROM Logic, RQM Decode Logic, I/O Ports Decode Logic, Time of Day (TOO) Logic, Dynamic Memory, Refresh Logic, Speaker Logic, Mode Switch Input Logic Keyboard interface, control Bus Logic, Address Bus Logic, Data Bus Logic, I/O Slot Signals, New Generation Motherboard, Motherboard Connectors and Jumpers, Design Variations SMPS.
3. I/O Controller: Introduction, FDD, HQD, Printer Controller Overview, System Interface
4. Display Adapter: Introduction, CRT Display, CRT Controller Principle, Colour/Graphics Adapter, Display Adapters-Device interface.
5. Computer Software Installation: Installation procedure for Operating system, Application software/s, Utilities, Antivirus packages.
6. Computer Network Installation: Selection of Topology, Installation, Maintenance, System Administration for Windows NT, Novell Netware, UNIX network operating systems, Windows 98 peer to peer Networking using TCP/IP, Windows NT Client/Server Installation & Maintenance, Management of Internet Accounts
7. Troubleshooting: Hardware and Software faults finding and Troubleshooting

Reference books:

1. IBM PC and Clones Hardware, Troubleshooting And Maintenance by B. Govindarajalu, TMH.
2. Microprocessors and Interfacing Programming & Hardware - D.V. Hall, TMH.
3. IBM PC Assembly Language & programming by Peter Abel, P.H.I.
4. Manuals of Novel Netware, UNIX and Windows NT.
5. Bigelow's Troubleshooting, Maintaining and Repairing PCs, 5th ed. TMH.

Course Code: 6.3

IT Enabled Services

1. Introduction: Overview of the IT enabled services
2. Business Process Outsourcing - The BPO book, success factors for BPO, Development of outsourcing, Justification of outsourcing, Management of outsourcing process, Entry model for BPO, strategic outsourcing. Overview of BPO: finance and accounts, human resource, transaction processing, supply chain management.
3. Challenges in BPO: Disaster management, marketing strategy, critical success factors, vendor evaluation, and selection process, commercial terms, transition planning and program management.
4. Call Centres: Call Centres in India, HR Strategies for Call. Centre Operations, Setting up and Growing Call Centre Operations, Competitive Advantage of Call Centres.
5. Internet Services: Internet Service Providers in India, Business Models for ISPs.
6. Voice over. Internet Protocol (VoIP): Concept, How VoIP can help Enterprises, The VoIP Revolution, Voice Portals, Internet Telephony
7. e-learning: Concept; Why e-learning, Technology advancement' (W AN/LAN, Internet, Teleconferencing, Video conferencing, Satellite communication), Demystifying e-learning Portals, The future of e-learning
8. Case studies: BPO Organization (Tricom), Call Centre (Mphasis), ISP (Satyam Infoway), e-learning (HP India, CISCO).

Books:

1. e-learning by Gaurav Chadha and S. M. Nafay Kumail (TMH)
2. e-learning by Vasu Deva (Commonwealth)
3. A Paper on So What is e-learning and How does it Impact my Internet? by Stephen Abram. (<http://www.infoday.com/IP/mar03/abram.shtml>)
4. <http://www.elearningguru.com>
5. <http://www.hpineducation.hp.com/contentindex.asp>
6. <http://www.cisco.comlwap/public/IO/wwtraininglearning>

7. <http://callcentre.education.ed.ac.uk>

8. www.tricominfo.com

Course Code: 6.4

Communication and Personality Development

1. Communication - Nature, Importance, Objectives, Principles of Communication, Process of Communication, Types and Forms of Communication Techniques of Effective Communication - Controls: Barriers of Effective Communication
2. Interpersonal and Intrapersonal Communication – Telecommunications, Teleconferencing, Fax, Internet & E-mail
3. Application of Electronic Media for Communication – Telecommunications, Teleconferencing, Fax, Internet & E-mail
4. Personality - Basics, meaning, Development of personality, Attitude & Emotions Negotiation, Leadership and Motivation.
5. Physical Appearance, Mental Power, Health, Fitness, Good Manners and ETIQUETTES, Time Management, Stress Management, Emotional Intelligence.
6. General Readings & Book Review - Seven Habits of effective people - Stephen Covey.

Reference Books:

1. The Essence of Effective Communication, Ludlow R. and Paton F. PHI 1985
2. Organization Behaviour - Stephen Robbins.
3. Communication in IT Age – Dhiraj Sharma
4. Business Communication Strategy and Skill – Munter M.PHI.1987
5. Organizational Behaviour – Udai Parekh

Course Code: 6.5

Information System Audit – II

1. The Application Control Framework: Introduction, Overview of Boundary Controls, Input Controls, Communication Controls, Processing Controls, Database Controls and Output Controls.
2. Evidence Collection- Audit Software, Generalized Audit Software, Industry - Specific Audit Software, Utility Software, Types of audit expert systems, Specialized Audit Software, Control of Audit Software.
3. Concurrent Auditing Techniques - Basic nature, need, types, implementation, strengths and limitations of concurrent auditing techniques.
4. Evaluating Asset Safeguarding and Data Integrity - Measures of Asset Safeguarding and Data Integrity, Nature of Global Evaluation Decision, Determinants of Judgment Performance, Audit Technology to Assist the Evaluation Decision, Cost-Effectiveness Considerations.
5. Evaluating System Effectiveness - Overview of effectiveness evaluation process, Evaluating System Quality, Evaluating Information Quality, Evaluating Perceived Usefulness, Evaluating Computer Self efficacy, Evaluating Information System use, Evaluating Individual Impact, Evaluating Information System Satisfaction, Evaluating Organizational Impact.
6. Evaluating System Efficiency - The Evaluation Process, Performance Indices, Workload Models, System Models, Combining Workload and System Models.
7. Managing Information System Audit Function - Planning, Organizing, Staffing, Leading and Controlling function, Towards Information System Audit. Professionalism, Some Futures of Information System Auditing

Textbook:

Information System Control and Audit - Ron Webber- Pearson

References books:

1. System Audit by Revathy Sriram M., TMH
2. EDP Auditing by Ron Webber- TMH
3. CISA Material, Information System Audit and Control Association, USA
