Syllabus

BACHELOR OF SCIENCE

IN

INFORMATION TECHNOLOGY

B. Sc. (IT)

PAPER - 1

SECTION – A

(FUNDAMENTALS OF INFORMATION TECHNOLOGY)

UNIT – 1 (HARDWARE)

- Brief History of develop of Computers.
- Computer System Concepts : Features & Limitations.
- Basic components of Computer Hardware, CPU, Memory Unit & I/O Unit.
- CPU Organization – CU, ALU, Registers.
- Memory organization – RAM, ROM, EPROM, PROM, Cache Memory.
- I/O Organization – VDU, Keyboard, Mouse, and secondary I/O Devices.
- Mass Storage Organisation – Magnetic Tape, Magnetic Disk, CD, DVD, Flash Storage Devices.
- Data Representation – Number systems – Binary, Decimal, Octal. 2's Complement. ASCII & EBCIDIC Codes.

UNIT –II (INTRODUCTION TO SOFTWARE)

- Types of Software
- System Software
    - Operating Systems
    - Command interpreters
    - Translator – Assemblers, Compilers, Interpreters.

- Types of Operating Systems
    - Batch Processing
    - Single Process Monitors
    - Multiprogramming – Real time
    - Online
    - Multiprocessing
- Programming Languages
    - Machine Language
    - Assembly Language
    - High Level Language
- Application packages
    - Word Processors
    - Spread Sheet
    - Presentations
    - Other Utilities
- Computer viruses - Working & spread of viruses, Types, Control of viruses
- Communication & Transmission
- Analog & Digital Signals
- Modulation – Demodulation (MODEM)
- Transmission Mode - Simplex, Half Duplex, Duplex
- Line Configuration - Point to Point
    - Multipoint
- Definition of computer networks
- Types – LAN, WAN & MAN
- Communication Protocols

REFERENCES

- COMPUTERS TODAY – BY S. K. Basandra, Galgotia Publication
- FUNDAMENTAL OF INFORMATION TECHNOLOGY – by Alexis Leon &Methews Leon, Vikas Publishing House, New Delhi
- COMPUTER FUNDAMENTALS – by P. K. Sinha – BPB Publications

SECTION – A

(STRUCTURED PROGRAMMING USING 'C' LANGUAGE)

UNIT – I (PROGRAMMING CONCEPTS)

- Programs & Program Development
- Flow Charts

- Pseudo Codes
- Programming Technique
  - Structured Programming
  - Top-down approach
  - Bottom-up approach
  - Object Oriented Programming

UNIT – II ('C' PROGRAMMING LANGUAGE)

- Overview – History & Features
- Structure of a 'C' Programme
- Variables, Expressions, Identifiers, Keywords, Data types & Constants Opreators – Arithmetical, Logical, relational, Conditional & Bitwise.
- Operators Precedence & Associativity
- 'C' – I/O – Charater Based & Formatted
- 'C' Control Statements
  - Decision Control – If, If-else, nested If-else
  - Loops / Iteration – while, do-while, for- loops
  - Break / continue / go to statements
- Arrays
  - Single & Multi Dimensional
- Strings
- Functions
  - Call by Value & Call by Reference
- Introduction to pointers
- Recursion
- Structure & Unions
- C – Files

REFERENCE

- PROGRAMMING IN 'C' – by E. Balaguruswany, TMH Publications
- PROGRAMMING WITH 'C' – by Gottfried, Schaums Series, TMH Publications
- O' LEVEL PROGRAMMING CONCEPTS 7 SYSTEMS – by V.K. Jain, BPB Publication
- 'C' COMPLETE REFERENCE – by Herbert C, TMH Publications

SECTION – C

(INTRODUCTION TO IBM ARCHITECTURES)

- Microprocessors & Microprocessor Faimilies
- Personal computers – IBM & Apple Series
- IBM PC Characteristics – PC / PCAT/ PCXT
- 8086 Architecture
- DMA Controller & Configuration
- YGA Controller
- Arithmetic Co-processor
- Clocks

REFERENCE

- IBM PC – by peter Norton
- COMPUTER ORGANISATION & AECHITECTURE – by William Stallings, TMH Publications

PAPER – II

Section – A (DATA BASE MANAGEMAENT SYSTEMS)

UNIT – I (DBMS BASICS)

- DBMS vs Files
- Organisation of DBMS
- Three Views & Schemes of DBMS
- DOL, DML, Queries, SQL
- Types of DBMS – Relational, Hierarchial& Network
- R – R Diagrams
- Generalisation, Specialisation, Aggregation

Unit – II (RDBMS)

- Relation – Definition, Functional Dependency Domain, Attributes, Tuples, Fields
- Keys – Candidate Key, Primary Key, Foreign Key
- Codd's Rules
- Normalisationupto BCNF
- Example RDBMS – ORACLE (Practical Classes)

REFERENCES

- DATABASE SYSTEM CONCEPT – by Korth&Siberschatz
- AN INTRODUCTION TO DATABASE SYSTEM – by Bipin Desai
- DATABASE MANAGEMENT SYSTEMS – by Leon & Leon, Vikas Publications
- AN INTRODUCTION TO DATABASE SYSTEM – by C. J. Date.

Section – B (OPERATING SYSTEM CONCEPTS)

UNIT – I (OS BASICS)

- Definition of OS
- Functions of OS
- Types of OS

UNITS – II (PROCESS MANAGEMENT)

- Process Definition
- PCB, Process States
- Scheduling – Algorithms & Types
- FCFS, SJF, Round Robin
- LTS, STS, MTS
- Premtive& Non-Premtive Scheduling
- Deadlocks – Avoidance, Detection & Recovery

- InterprocessSynchronisation – Semaphores & Mutual exclusion

Unit – III (MEMORY MANAGEMENT)

- Fixed & Dynamic Partitions
- Compaction
- Paging
- Segmentation
- Virtual memory, Pagje Replacement Algorithms

UNIT – IV (DEVICE MANAGEMENT)

- Overview – Types of I/O – Serail& Block I/O
- Programmed I/O
- Interupt Driven I/O
- DMA
- Polling, Daisy-Chaining, Multiple Interupt Lines
- Dvice Drivers & Device Controllers, BIOS, IS<Device Independent Software

UNIT – V (FILE MANAGEMENT)

- Blocks, Sectors. Clusters, Directories
- Files - Concepts & Definitions
- Types of files &Organisation
- Disk Free Space Management
- Disk Free Space Allocation
- Disk Scheduling

UNIT – VI (DISK OPERATING SYSTEM (DOS)

- History & Versions
- Booting – FAT, Directory Structure
- DOS System Files
- DOS Commands – Internal & External
- DOS – Batch Files

REFERENCE

- OPERATING SYSTEM CONCEPT – by GalwinStlberschatz
- OPERATING SYSTEMS – by Tenanbaum
- OPERATING SYSTEMS – by Dietel

SECTION – C (BASIC ELECTRONICS – I)

UNIT – I

- Types of resistance, Resistance symbol, Color code, capacitor's symbol, Code types, Mica & paper capacitor. Inductance, Conductor, Insulator, Band Theory, Intrinsic & extrinsic semiconductors, Theory of p-n Juction, Capacitance & Diffusion capacitance

Unit – II

- Zener diode, Tunnel diode, Varactor diode, Power diode, photo diode, LED, LCD, Point contact. Diode. Schottky diode, Halfwave&fullwave rectifier with & without filter

UNIT – III

- BJT Characterisjtics, CE, CB, CC configurations, FET Metal oxide, Semiconductors(MOSFET). CMOS, Unijunction transistor & Photo transistor.

UNIT – IV

- Single stage RC coupled amplifier frequency response class A, Class B, Class AB, Class C, Push pull amplifier, Efficiency distortion in amplifier their merits &demeritis. BJT & FET RC coupled amplifiers.

UNIT – V

- Switching Characteristic BJT & FET, Monostable&AstableMultivibrators, RC integrators & differentiators, Clipper & Clamber circuit.

REFERENCE

- BASIC ELECTRONICS – by B. L. Thareja
- BASIC ELECTRONICS – by A. K. Sahani
- BASIC ELECTRONICS – by V. K. Mehta

IIND YEAR

PAPER – IST

Section – A DATA STRUCTURE

- Dynamic Memory Allocation – Malloc ( ), Alloc ( ).
- Analysis of Algorithms.
- Arrays – Searching, Sorting, Insertion, Deletion, Merging.
- String, Manipulation.
- Linked Lists – Single & Double, Operations.
- Sparse Matrices, Operations.
- Stacks - Operations, Infix, Prefix & Postfix Notations.
- Queues – Operations, Circular &Deque.
- Trees – BS Tree, AVL- Tree, B-Tree, Heap Searching & Sorting Techniques.
- Graphs – Adjencency, DFS BFS, Minimum Spaning Tree, Dgikistra&Kruskals Algorithms.

SECTION – B DISCREETE MATHEMATICS

Unit – I Boolean Algebra

- Introduction to Boolen Algebra
- Basic Postulates
- Canonical Forms – Sum of Products & Product of Sums.
- Karnauge Maps
- Simplification Using Karnaugh Maps.

Unit – II Circuit Design

- Introduction to Digital Logic
- Gates – Invertors, AND, OR, XOR, UNIVERSAL NAND GATE, UNIVERSAL NOR GATE, TRUTH TABLES AND LOGICS DIAGRAMS.
- Basic circuits – Adders, Decoders, Encorder, Multiplexers, Flip-Flops etc.

SECTION – C UNIT – I / LINUX

- Basic Features, Advantages, Basic , Architecture of Unix / Linux System, Kernel, Shell.
- Linux File System – Boot Block, Super Block, Inode Table, Data Blocks, How Linux access files, storage files, Linux standard, directories, Commands for files and directories cd, Is, Cp, md, rm,mkdir, rmdir, more, less, creating and viewing files, using cat, checking disk free spaces, Linux system stratup and shut-down process.

UNIT – II / LINUX

- Understanding shells, Processes in linux, connecting processes with pipes, Redirecting input, output, Background processing, managing multiple processes, changing process priority, scheduling of processing at command, batch commands, kill, ps, who, sleep, Printing commands, find, sort,Cal, Banner, touch, file, file related commands-ws, sat, cut, grep, dd, etc, Mathematical Commands bc, expr, factor, units.

IInd YEAR

PAPER – IIND

SECTION – A OBJECT ORIENTED PROGRAMMING USING CC++

Unit – I Oops Basics

- Objects
- Classes
- Polymorphism
- Reusability
- Inheritance
- Message
- Passing
- Genericity

Unit – II C++ Programming Language

- History & Features, Introduction of Classes, Comprasion / Additional Features to C-Language.
- Object oriented features in C++
- Scope Resolution Operator
- Static Data Member
- Static Function
- Passing object of function
- Returing Objects.

- Constructors &Distructors
- Function Overloding In C++, Operator Overloding in C++
- Inline Function, Friend Function
- Inheritance – Single, Multiple, Multilevel Virtual Functions
- Void Pointers
- Pure Virtual Functions
- Function Templets& Class Templets.

IInd YEAR

PAPER – IIND

SECTION – B COMPUTER NETWORKING & INTERNET

UNIT – I

- Need & Advantages of Networks, Types : Server bases, Peer Based, Hybrid.
- Topology, Network media types, H/w protocol, Software protocol, digital singaling, analog signaling, bit synchronization, base band and broad band transmission.

Unit – II

- OSI and IEEE 802 Model, IEEE 802.3, IEEE 802.4 IEEE 802.5 & fast Ethernet FDDI, A TM, LAN access techniques, Bit map protocol.

Unit – III

- Connectivity, Hubs, Repeaters, Bridges, Multiplexeres, Router, Gateways, Modem, Types of Modem, Modulation Schemes.

Unit – IV

- Internet V/s Intranet, growth, ISP, Connectivity, Dial up, Leased line, URL, Domain name Portals Application, POP & Web based e-mail, merits, IP addressing.
- Basics of sending &receiving e-Mails.

Unit – V

- Internet Chatting , WWW, HTTP, URL, HTML.
- Over view of e-commerce, Internet, e-business, Advantage of E-commerce.

PAPER – IIND

Section – C DIGITAL COMPUTER ORGANISATION

Unit – I

- CUP ORGANIZATION : ALU & Control Circuit, Idea about Arithmetic, Ciruits, Program Control, Instruction Sequencinf.

Unit - II

- INPUT-OUTPUTORAGANIZATIONS : I/O interface, Properties of simple I/O devices and their controller, Isolated Versus memory-mapped, I/O, Modes of Data transfer, Synchronous & Asynchronous Data transfer, Handshaking, Asynchronours serial transfer, I/O Processor.

Unit –III

- MEMORY ORGANIZATION : Memory Hierarchy, Auxiliary memory, Manetic drum, Disk & Tape, Semi-conductor, memories, Associative, memory, virtual Memory, Address Space & Memory space, Address maping, Pages table, Page Replacement, Cache memory, Hit Ratio, Various mapping techniques, writing into Cache.

3rd YEAR

PAPER – I

SECTION – A : JAVA PROGRAMMING

Unit – I

- C++ Vs Java, Java and Internet and WWW, Java support systems, Java environment, Java Program Structure, Tokens, Statements, Java Virtual machine, Expressions & its Evaluation, Data Types, Jumps in Loops, Labeled Loops.

Unit – II

- Defining a class, Adding variables and method, Creating objects, Assessing class members, Constructors, Method overloading, Static members, Nesting of methods, Inheritance : Extending a class, Overriding methods, Final variables and methods, Final classes, Finalizer methods, Abstract methods and classes, Visibility control.

Unit – III

- Arrays, One dimensional &teo dimensional Strings, Vectors, Wrapper classes, Defining interfaces. Extending interfaces, Implementing interfaces, Accessing interface Variables, System packages, Using System packages, Naming Conventions,-creating packages, Accessing a packages, Using packages, Adding a class to a packages, Hiding classes.

Unit – IV

- Threads, Creating threads, Extending the threads class, Stopping and blocking a thread, Life cycle of a thread, Using thread methods, Thread exceptions, Thread priority, Synchrozation, Implementing the runnable interface.

Unit – V

- Applets, Local and remote applets, Applets Vs applications, Writing applets, Applets life Cycle, Creating an executable applet, Designing a web page, Applettage, Adding applet to HTML file,Running the applet, Passing parameters to applets, Aligning the display, HTML tags &applets,Getting input from the user.

PAPER – I

Section – B Internet and Web Designing

Unit – I

- Introduction to internet Applications : Introduction to internet, WWW, News group, E-Mail, Messaging Protocals, Inter Protocals (HTTP, FTP, TFTP, DNS, SMTP, IMAP, POP and TCP/IP), Setting up Internet connection using Dial-up and leased-line (broadband). Creating E-mail, Sending mails, Attachments, using FTP services.

Unit –II

- Web Page Designing : using different browsers. (Internet Explore / Netscape Navigator) Browsing internet and E-mail service providers, Features of internet Services (Chatting, Conferencing), MIRC, HTML &DHTML : HTML tags, Designing Tables, Frames and Forms, Placing images, animation and Sound on Sites, Using Hit Counter. Adding VB Script code html pages, Scripting Functions. Using Front Pages 2002 Hosting your website using The Free hosting Sites like yahoo, Angelfire, etc.

Unit – III

- Server side programming using ASP : Asp objects, DOM, Database accessing on Web, Using forms for perform Query in Database.

SECTION – C INTRODUCTION TO NETWORK SECURITY

Unit – I

- Introduction : Networking Terminologies, Active Vs Passive Attacks, Viruses, Worms, Trojan Lorser. The Multi Level Model of Security, Legal Issues. Introduction, Breaking an Encryption Scheme, Types of Cryptographic Functions-Secred Key, Public Key, and Hash Algorithms. Data Encrpption Standards, International Data. Encryption algorithm, Advanced Encryption Standard, RC4 Modes of Operation, encrypting a large message, Generating MACs, Multiple Encryption DES. Public Key Algorithm, Modular Arithmetic, RSA, Diffie-Hellman, Digital Signature Standard.

Unit – II

- Authentication : Password based, Address based, cryptographic authentication protocols, Eavesdropping and Server Database reading, Trusted Intermediaries, Session Key, Authentication of people Security Handshake pitfalls. Electronic Mail Security, PGP (Pretty GOOD Privacy). Firewalls,web Issues.

PAPER – III

SECTION – A VISUAL PROGRAMMING WITH VISUAL BASIC

Unit – I

- Visual Programming : The Fundamental of visual Basic, Introduction, VB Editions, Working with visual Basic, IDE, The element of the user-interface, Designing the user Interface, Programming an application, Visual Development and Event-Driven Programming, Customizing the environment.
- Visual Basic the Language : Visual basic projects, the project files, variable, constants, Arrays, Collections, procedures, arguments, function returns values, control flow statements, looping statements, nested control structures, exit statement.
- Working with forms : The appearance of the form, desiging menus, building dynamic forms, drag and drop operations, mouse conflicts.
- Basic Active X Controls : The textbox control, the list box and combo box controls, the scroll bar and slider controls, the file controls.
- Advanced Active X Controls : The common dialogs control, using the common dialog control the tree view and list controls, the rich text box control, the RTF languages, the msflexgrid control.
- Multiple Document Interface : MDI applications, parent and child and child MDI forms, Accesing child forms, Implementing scrolling forms.
- Database Programmimg with VB : The Active data objects, data environment, sql , mshflexgrid control, ado, Dao, Library, Report designing using data report. Interfacing with MS-access & Oracle database.

SECTION – B SQL SERVER

Unit – I

- Introduction : SQL Server 2000 Relational Database Management System and Conventional database systems. Installing SQL Server. Working with Enterprises Manager. Configuring a Database, Creating Tables, Views, Defining constraints, Creating relationships. Designing Database diagram. Creating Indexes. Creating user-defined data types, Creating Stored Procedures and Function.
- Working with Query Analyzer, Writing queries, Using relational operators like project, join, Intersect, union, difference. Built-in SQL functions. Performing data manipulation from query analyzer. Query optimization.
- Using OLE DB, ADO for interfacing with front-end applications designs in VB, Java etc.

Section – C SYSTEM ANALYSIS & DESIGN

Unit – I

- SYSTEM CONCEPTS : The system concept, Characteristics of system, Elements of system, Types of system, man made information systems.

- SYSTEM DEVELOPMENT LIFE CYCLE : Recognition of need, Feasibility study, Analysis, Design implementation, post implementation and maintenance System planning and control.
- SYSTEMS PLANNING AND INITIAL INVESTIGATION : Bases for Planning system analysis, Determing users requirements and analysis, Fact finding, Determination of feasibility.
- TOOLS OF STRUCTURED ANALYSIS : Logical and Physical Models, Data flow diagram, Data dictionary, System structured charts, System model, Pseudo codes, Decision tree, Decision tables,HIPO chart, Gantt charts, Warries diagram.
- FEASIBILITY STUDY : System performance constraints, identification of system objective, feasibility analysis and report.
- SYSTEM DESIGN : Stages of system design, Logical and Physical design methods, From driven mythologies ; IPO and HIPO charts, structured walk through, Audit considerations; Processing controls, Data validation, Audit trail and documentation control.