Syllabus of B.A./B.Sc.(Computer Application)

B.A./B.Sc. I Year (effective from 2008)

Theory:

I Paper : **Introduction to Computer & Operating System**

II Paper : **Programming in 'C'**

III Paper : **PC Softwares**

Practicals : Practical will be based on C programming, Data Structure & O.S. commands

B.A./B.Sc. II Year (effective from 2009)

Theory:

I Paper : **DataBase Management System & Applications**

II Paper : **Object Oriented Programming**

III Paper : **Computer Organisation**

Practicals : Practical will be based on DBMS Programming, Object-Oriented Programming.

B.A./B.Sc. III Year (effective from 2010)

Theory:

I Paper : **Data Communication and Network Management**

II Paper : **Internet & Web Technologies**

III Paper : **Programming with Visual Basic**

IV Paper : **System Analysis & Design**

Practical: Practical will be based on HTML and Visual Basic Programming. In B.A./B.Sc. III year, there will also be a mini Project in which students will have to work on given assignment and submit a report.

DETAILED SYLLABUS OF B.A./B.Sc. I YEAR

I Paper: Introduction to Computer & Operating System

Introduction to computers – Definition, Characteristics, Generation, Applications, Classifications, Hardware, Software, Computer Arithmetic & Number System, Decimal, Binary, Octal & Hexadecimal System. Arithmetic Operations on Binary Numbers. ASCII, EBCDIC, BCD codes, Fixed point & floating point representation of numbers.

Computer Organization & Architecture – Memory hierarchy, Primary Memory - memory unit, SRAM, DRAM, SDRAM, RDRAM, Flash memory. Secondary storage devices- Magnetic Disk, Floppy Disk, Optical Disk, Magnetic Drum , Input Devices, Output Devices.

Disk Organization – Disk Storage Capacity, Physical File System, System Area, Boot Record, File Allocation Table (FAT), Root Directory Area, Data Area, Physical Storage and Retrieval Mechanism, Disk Partioning.

Softwares – Introductory ideas of System Software, Application Softwares, Operating System, Translators, Interpreters, Compilers, Assemblers, Generation of Languages.

Operating System : Definition, Introductory ideas of single user and multi-uer operating system, Time sharing, multitasking, multiprogramming, Batch Processing, on-line processing, spooling.

Introduction to MS-DOS – Booting, Components of MS-DOS, MS-DOS General Command, Internal & External Commands, Directory Commands, File Management in DOS & Commands, Disk Management Commands Utility Commands, Batch Files & Configuring DOS.

Introduction to Windows – Windows basics, Windows Accessories, Miscellaneous Windows features, Web Features & Browsers.

Case study of LINUX/UNIX operating system and its commands.

II Paper: Programming in C

Overview of Programming – Introduction to Computer Based problem Solving, requirements of Problem Solving by the Computer, Programs & Algorithms & Flow Charts.

An Overview of C, Structure of C Program, Storage class specifier & data types, Construct and variable declaration, operator & expression.

Program Control Statements – True and false in C, C statements, Conditional Statements, if, switch, for , while, do/while, break, exit (), continue, goto.

Basic I/O : Formatted and unformatted input/Output, Functions Return statement, local & global variables, Scope rule of functions, function arguments, parameters passing – call-by-value, call-by- reference, function prototypes, function call with array, recursion, implementation issue.

Arrays ,declaration, one & two dimensional array, multidimensional arrays.

Advanced Features in C – Pointers, pointers variables, pointers operators, pointer expression, dynamic allocation function – malloc (), free (), calloc(), Initialising pointers, pointers to function, pointers and arrays.

Structures, Unions and user defined variables - Basics of structure, declaration of structure, Array of structure, passing structure to function, structure pointers, Nested structure.

File Management – Stream and files, Console I/O, file pointer, file management functions.

Data Structures – Basic concept of data representation, algorithm design and data structure. Overview of arrays, linked list, stack and queue.

III Paper: PC Software

Introduction to Microsoft Windows environment, Introduction to Word Processing , Microsoft word screen, file menu, edit menu, view menu, insert menu, format menu, tools menu table menu, alignment of text, applying fonts, working with wizards, size of text, font of the text, colour of the text, Understanding Microsoft Excel for windows, understanding spreadsheets, file menu, edit menu, view menu, insert menu, format menu, tools menu, data menu, creating a Worksheet in Excel for windows, copying formula, formulas that make decisions, functions in Excel, sum function, average function, function wizard, functions in Excel, Date and time functions, logical functions, creating charts in Excel, creating graphs, modifying chart, adding data to a chart, Introduction of PowerPoint for windows, file menu, edit menu, view menu, insert menu, format menu, tools menu, slide show menu, creating presentation by AutoContent Wizard, creating a new presentation entering the text, moving the text, reordering slides, duplicating slides, deleting slides, making slide shows, adding effects, adding animation, creating your own animation, Introduction to PageMaker, Coral draw and Photoshop, Desktop publishing,

modifying and editing of text document or photographs, different tool-bars available in PageMaker, Corel draw and Photoshop.

DETAILED SYLLABUS OF B.A./B.Sc. II YEAR

Paper I : Database Management System & Applications

Overview of Database Management – File oriented approach versus database oriented approach to data management, Disadvantage of file oriented approach Data Independence, DBA and its role, DBMS architecture, Different types of DBMS users, Data dictionary and it contents, Types of Database Languages, Different Type of Data Models

Relational Model - Definition of relational model, concept of keys, candidate key, Primary key, Foreign key, Fundamentals integrity rules, Relational Algebra.

Database Design – E – R model as a tool for conceptual design, entities, attributes and relationship E R diagram, strong and weak entities,

Normalization concept in relational model, Functional dependencies, Normal Forms (1 N F, 2 N F, 3 N F, B C N F, 4 N F).

SQL – SQL Construct, (SELECT - - - FROM - - - WHERE - - - GROUP BY - - - HAVING - - - ORDER BY), INSERT, DELETE, UPDATE, VIEW, definition & use, Nested Queries.

FoxPro – Introduction to FoxPro, Database Construction, searching, sorting, indexing, Updation, Reports, Screen Designing, Programming Concepts, Managing numbers & date. Case Studies - Inventory control system, Payroll Processing etc.

II Paper : Object Oriented Programming

Introduction to Object Oriented Concept : Overview of object oriented system, Abstract data Types, Inheritance, Polymorphism, Object Identity, Object Modeling Concepts, Object Oriented Design, Object Oriented Programming Languages, Object Oriented Database.

C++ Programming Language : Overview of C++, Programming Paradigm, Support For Data Abstraction, Support for Object Oriented Programming, Declaration and Constants, Expression and Statement, Function and Files : Linkages, How to Make a Library, Functions.

Classes and Objects : Definition of Class, Class Declaration, Class Function Definition, Member Function definition inside and outside the class declaration, Scope resolution operator(:

:),Private and Public member function, Nesting member function, Creating Objects, Accessing Class data members, Accessing member functions, Arrays of Objects, Objects as function arguments.

Operator Overloading : Operator Function, User Defined Type Conversion, Litreral, large objects, Assignments and Initialisation, subscripting, function call, dereferencing, increment and decrement, A string Class, Friends and members.

Inheritance through Extending Classes : Concept of Inheritance, Base Class, Derived Class, Defining derived classes, Visibility modes, single inheritance.

Streams, Templates and Design of Libraries : Output, Input, Formatting, Files and Streams, C-I/O, Design of Libraries.

III Paper : Computer Organisation

Digital Devices: Introduction to Logic gates, Flip Flops, Latches, Registers, Shift Registers, Encoders , Decoders & Code Convertors, Counters, Digital Multiplexers/Data Selectors, Digital De-Multiplexers/Decoders.

Logic Design: Boolean Algebra, Minimum Boolean Expression, Karnaugh Map & Boolean Expression.

Memory: Main memory, Secondary memory, Cache Memory, Real(or Physical) & Virtual memory, Semicondutor memory, memory controller, magnetic memory, optical memory.

Central Processing Unit (CPU): CPU organization, Arithmetic & Logic Unit, Control Unit, Registers, Addressing modes, Instruction Cycles, Introduction to fetch operation, execute operation, Machine Cycle & State, Instruction & data Flow, Brief description of Intel microprocessors.

I/O Devices: Keyboard, mouse, light pen, optical scanner, OMR, optical Bar-Code reader, Magnetic ink Character Reader(MICR), touch screen, CRT Terminals, non CRT display, LCD(Liquid Crystal Display), TFT- LCD monitor,plasma display, Printers- impact & non impact printers, inkjet printers, laser printers.

DETAILED SYLLABUS OF B.A./B.Sc. III YEAR

I Paper: Data Communication & Network Management :

Computer Communication & Network, Data Communication, Data Transmission : Serial and Parallel, Modes of Data Transmission : Asynchronous and synchronous, Types of Transmission : Analog and Digital, Types of Transmission System : Simplex, Half –

Duplex and Full – duplex, Communication Media, Modems, Data Multiplexers, Computers Networks, Server, Transmission Technology, Local Area Network, Topologies : Star, Ring, Bus, Wide Area Networks, MAN, OSI Models of ISO, Network Protocols : SPX/IPX TCP/IP.

Telnet : Remote Login, Telnet Protocols, Basic Concepts, Telnet Clients : Windows 98/95 Telnet Program,Hyper terminal, Unix for Telnetting , Terminal Emulation.

Management of a LAN – LAN, Definition and usage, Major components, architecture, initiation to Novell Netware, IPX command, Netx Command, Changing Drives, Logging in , Giving passwords, changing password, Loggingout, Login Restriction, LAN Community, Regular user, User group, operator & Supervisor, Storing of files, Network drives, Map command, Network rights, File management, Netware Rescue, Filter utility, Access method, syscon utility, Login scripts.

II Paper: **Internet & Web Technologies :**

Internet – evolution, Applications, Technologies, Working, Clients & Servers, Internet Services, Online Services, TCP/IP, Getting Connected, Different type of connections, ISP, Address in internet, intranets.

E – mail – E-mail basics, E – mail networks, Protocols, working, Format of an E-mail message, Basic E – mail functions, E-mail clients – Netscape messenger, outlook express, E-mail security,

FTP – The file transfer protocol introduction and basic procedure, Types of FTP Servers, FTP Softwares, Command Driven clients and GUI – driven Clients, FTP with web Browsers.

World Wide Web (WWW) – Evolution, Basic features. Clients & servers, URL, HTTP, HTML, XML, multi media, WWW Browsers, WWW Servers, using a Web Browser eg. Internet Explorer.

Web Publishing – Website planning, Publishing Tools, The Front Page Solution,

HTML – Designing and decoration of web pages using HTML's basic features in different style & Looks.

Internet Security – Need, Web Search engine, web meta searcher, web search Agents, E-mail Threats, Firewall, Firewall Architecture, Choosing a suitable Firewall.

III Paper: Programming with v**isual basic**

Visual Basic Environment : Parts of environment, getting help, customizing VB, Quiting.

Creating Forms : adding new forms, changing appearance and behavior, properties, properties related to forms. Adding Functionality : working with controls properties Variables and operators : Understanding data type, standard variable types, integer special variables types, arithmetic operators, comparisior and logical operators.

Built-in-Function, Control structure.

Data Structures : Understanding arrays, searching, sorting.

Dialog Boxes : Creating message boxes, getting user input, custom dialog boxes.

File Handing : File types, opening, handing, reading files, updating, INI files.

IV Paper: System Analysis & Design

System Concepts & Information System Environment: Introduction to the system concepts: Definition . Characteristics of a system: Organisation , Interaction ,. Interdependence, Integration .Central Objective. Elements of a system: Control. Feedback. Environment. Types of Systems: The system development life cycle: recognition of need, feasibility study, analysis , design , implementation.

System Planning and the initial investigation: dimensions of planning, initial investigations: need identification, determining the user's information requirements. Problem Definition and project initiation, background analysis. Fact – finding , fact analysis. Determination of feasibility, information about the firm. Information about the user staff, Information about work flow.

The tools of structured analysis: Structured analysis – the tools of the structured analysis: the data flow diagram (DFD), data dictionary, decision tree and structured English, decision tables. Feasibility study- system performance definition: statement of constraints, Identification of Specific system objectives, description of objectives.

Cost/benefit analysis and system design: Introduction, data analysis, cost benefit analysis, cost and benefit categories, procedure for cost benefit determination, the system proposal, the process of design: logical and physical design, design methodologies: Structured design, Form driven methodologies. Audit considerations: Processing control and data validation, audit trail and documentation control.

File organization and database design: File structure file organization, sequential organization, indexed sequential organization, inverted list organisation, direct access organisation,

System Testing and Quality Assurance: System testing, the nature of test data, the test plan, activity network for system testing, system testing, quality assurance, quality assurance goals in the system life cycle. Levels of quality assurance, role of the data processing auditor, the audit trail.