Syallabus
Computer Science
(as one subject in B.Sc.)
2008-2010

Paper No.	Paper code and Title	Marks
	I Semester	
Paper 1	**101 Digital Computer Fundamentals**	**50**
Paper 2	**102 Programming in C**	**50**
Practical	**103 Computer Lab Program in C**	**50**
	II Semester	
Paper 1	**201 Introduction to Information Technology**	**50**
Paper 2	**202 Date Base Management System**	**50**
Practical	**203 Computer Lab Program in Fox Pro**	**50**
	III Semester	
Paper 1	**301 Date Structure and File Organisation**	**50**
Paper 2	**302 Operating System**	**50**
Practical	**303 Computer Lab program in C related to date structures**	**50**
	IV Semester	
Paper 1	**401 object Oriented Programming in C++**	**50**
Paper 2	**402 Computer Organisation**	**50**
Practical	**403 Computer Lab program in C++**	**50**
	V Semester	
Paper 1	**501 Internet & its Application**	**50**
Paper 2	**502 Advanced Programming with Numerical Methods**	**50**
Practical	**503 Practical for Numerical Methods**	**50**
	VI Semester	
Paper 1	**601 Software Engineering**	**50**
Paper 2	**602 Artificial Intellince**	**50**
Practical	**603 Practical related to Application Software**	**50**

I Semester Paper-1 (101)
DIGITAL COMPUTER FUNDAMENTALS - I

Unit – I

Number system and Information codes : Binary, Octal & Hexadecimal number systems. Conversion from one system to another.

Computer arithmetic : Various operations – addition, subtraction. multiplication and division. Computer Codes – BCD, EBCDIC and ASCII codes.

Unit – II

Boolean algebra and gate network – Fundamental Concept of Boolean algebra, logical addition and logical multiplication, AND gates and OR gates, Complementation and inverters, evaluation of logical expressions.

De-Moregan's thorem the principal of duality Inter connectin gates, NAND gates and NOR gates, Design un NAND to AND and NOR to OR gate network.

Unit – III

Logical design of Flip-Flops, Transfer circuits, Clocks, Gated flip-flop, Master slave flip-flop, J-K flip flop.

Unit-IV

The memory element – Primary Storage – Storage locations and addresses storage capacity, RAM (Random accessmemory), Linear select memory organisation, ROM (read only memory), PROM EPROM, Cachememory, Secondary storage devices.

Unit-V

Arithmetic operations on Binary numbers in terms of 1's & 2's complements, Half-adder and Full adder, Decoders, Registers and Counters.

Books Recommended :

1- Computer Fundamentals- B.Ram
2- Computer Fundamentals- P.K.Sinha

I Semester Paper 2– (102)
PROGRAMMING IN C

Unit-I An overview of Programming. Problem identification problem Analysis Logic representation tools: Flowchart & Algorithm, program coding, Testing Debugging etc.

Unit-II 'C' Programming structure of a program, Data types constant, variables, Expressions, Operators, Assignment statements.

Unit- III Input/Output statements, Control statements.

Unit- IV Array, Single dimensional, Multi dimensional array, Function & Procedure.

Unit-V Structure, Unions & Pointers

Books recommended:

1. Programming in 'C' by Gottfried.
2. 'C' Programming, Balaguruswami.
3. The 'C' Programming Language – B.W. Kernigham & D.M. Ritchie.

I Semester Paper 1– (201)

INTRODUCTION TO INFORMATION TECHNOLOGY

Unit 1:

Information Concept Number System- Evolution of Computer System. Range of Application Scientific, Business, Educational, Industrial, National level, Weather processing Remote sensing.

Unit 2:

Programming languages: Assembly, Higher level languages, Fourth Generation languages.
Hardware: Input, Output devices, memory Semiconductor, Magnetic memory .
Type of Software, System Software, Application Softwar.

Unit 3:

Introduction to data communication Introduction to Digital to Analog Communication, Parallel and serial communication, Synchronous and Asyrichronous Communication Simplex, Half Duplex and Full Duplex Communication.
Commercial channels Wired Transmission, Optical Fiber Transmission, Microwave Transmission Satellite Transmission.

Unit 4:

Single user and Multi user system, Client server system, Distributed Processing System.
Network LAN, WAN, Network Topologies and Network Protocol's.
Internet concept. WWW.Browsers, Electronic Mail and Introduction to HTML

Unit 5

Introduction to O.S. Batch System Multi Programmed batches system
Immeshaing System, Panalled System, Distributioned System, Real TimeSystem O.S. Services and Functions.

Books :

1- Information Technology TODAY " by S. JAISWAL. Galgotia Publication.
2- Computer Today - by Suresh Ku Basandra
3- O Level Information Tech " PEARL Software
4- Module-1 Information Technology " by Asian Publication Delhi.

II Semester Paper –2 (202)
DATA BASE MANAGEMENT SYSTEM

Unit-I

Data Base Basics: Data modeling for a database, records & files, Abstraction & data Integration, the three level architecture for a DBMS. Components of DBMS. Classification of DBMS Users. DBMS facilities. Structure of a DBMS, advantages & disadvantage of a DBMS.

Unit-II

Data Base Models: Introduction to Entity relationship model, the relational data model the Network data model the Hierarchical mode File Organization-Introduction, serial files, sequential files; Index sequential files, Direct , files, Secondary key retrieval.

Unit-III

Normalization & SQL Introduction, Functional dependency, Anomalies in a database, Properties of Normalization, 1 NF, 2NF, 3NF. Categories of SQL. commands, Data definition. Data manipulation statements, views etc. Recovery, security, Introduction to RDBMS, advantages and disadvantages of RDBMS.

Unit-IV

FoxPro: Introduction to FoxPro, viewing and editing data, Modify structure, Memeo fields & file utilities, sorting and Indexing database files, Printing reports and labels, memory variables, data & time function & keyboard macros, Mathematical commands & function.

Unit-V

Programming with FoxPro, Error conditions & program debugging aids, multiple database files, the @ commands and debugging custom screen, windows menus & Popups, advanced features of foxpro.

Books Recommended:

1. An Introduction to database system -Bipin C. Desai, Galgotia Publications, Pvt. Ltd. New Delhi.
2. Foxpro 2.5 made simple for DOS windows -R.K. Taxali, BPB Publication, New Delhi.

Reference Books:

1. Data Base System Concepts Henry F. Korth, Araham.

III Semester Paper 1– (301)
DA TA STRUCTURE AND FILE ORGANIZATION

Unit -I

Concept of data Structures, Data type, Primitive versus, Non-Primitive type, Logical versus physical implementation. Data structures in programming languages. Mapping to storage integers, characters, strings.

Unit -II

Linear Data' structure and operations associated with them (Traversal, search, insertion, deletion, implementation techniques). One and two dimensional arrays, sequential allocation, address calculations, Algorithms for one-dimensional array for traversal. Search, insertions, deletion sorting (selection sort, bubble sort, quick sort merging, binary search).

Unit -III

Simple lists, group lists, Circular lists, Operations on linked list for traversal, searching, insertion, deletion, splitting concatenation and reversing, comparative study of sequential and linked storage in, terms of memory utilization, processing time.

Unit -IV

Application of data structure (e.g., Stocks, Queues, Records, Linked lists), general and binary trees.

Unit -V

File Systems, File Organization, File operation sequential organization. Relative File Organization; Hashing.

Books Recommended :-

1. Data Management and File Structure: Mary E.S. Loor:nis. Prentice Hall of India, New Delhi
2. Data Structure -Schaum Outline Series.

III Semester Paper –2 (302)
OPERATING SYSTEMS

Unit -I Introduction to Operating System:

What is an Operating System? Early systems, simple batch systems, multi-programmed batch systems, Time sharing system, Personal Computer systems, Parallel systems, Distributed systems, Real time systems,

Unit -II Computer System Structure:

Computer system operation, I/O structure, storage structure, storage Hierarchy, Hardware protection, General system architecture Operating system structures-system components, Operating system services, system calls, System programs, system design and implementation, system generation.

Unit -III Process Management:

Process concept, process scheduling, Operation on processes, co-operating process, Threads process, Interprocess communication, CPU scheduling-Basic concepts scheduling criteria, Scheduling, Algorithms, Multiple-processor scheduling, Real time scheduling. Algorithm Evaluation.

Unit -IV Process Synchronization:

Background, The critical-section problem, Synchronization hardware, Semaphores, Atomic transaction. Deadlock-System model. Deadlock characterization, methods for handling deadlocks, deadlock prevention, deadlock avoidance, Deadlock detection, Recovery from Deadlock handling. Combined approach to Deadlock handling.

Unit -V Memory Management:

Background, logical versus Physical address space, Swapping, Contiguous allocation, Paging, segmentation, Segmentation with paging. Virtual memory-Background. Demand paging, performance of demand paging, page replacement algorithms. Allocation of frames. Thrashing other considerations, Demand segmentation.

Books Recommended:

1. Operating System Concepts- A. Silberzchaz & P.B. Galvin, Addison - Wesley
   Publishing Company.

IV Semester Paper –1(401)
OBJECT ORIENTED PROGRAMMING IN (C++)

Unit -I

Evolution of programming languages object oriented programming languages, programming & its advantages. Basics of C++; C++ character set, key words, data types, variables, identifiers, literals,. Operators, expressions simple I/O statements & programs, control structures.

Unit -II

Arrays and structure. Pointers functions classes and objects -class declaration, constructors distracters, Assigning objects, passing objects as function arguments, returning objects from functions, array objects.

Unit -III

Classes & objects: Advanced Features-Object pointers, Inheritance, static data member, static member functions. Function overloading, overloading constructor function, copy constructors:

Unit -IV

Operator overloading of binary, unary operators, Relational and logical operators, Friend function, friend operator, functions

Unit -V

Inheritance-Access control of base class protected Access control, Multiple inheritance, Virtual base classes, virtual functions. C++ I/O system.

Text Books:

(1) Programming with C++ made simple by M. Kumar, Tata Mc Graw Hill
(2) Programming with C++ by Balaguru Swamy.

IV Semester Paper –2 (402)
BSIT- 303
COMPUTER ORGANIZATION

Unit-I

Basic Computer Organization -Interconnection of Units, processor' to Memory Communication, I/O to Processor Communication, Interrupt Structure, Multiprogramming Processor Features.

Unit-II

Number System: Binary, Decimal, Octal, Hexa-decimal, Fixed-point and Floating point representation, l' s and 2' s Complement, Concept of Boolean algebra, Logic Gates, Karnaugh Map

Unit-III

Flip-flpos, registers, Counters, Decoder, Encoder, Multiplexed, De-multiplexer

Unit-IV

Concept of RISC & CISC, Memory Organization, Parallel Processing, Design of ROM

Unit-V

Microcomputers: Ideal & Actual Microcomputers, Memory Systems for Microcomputers, Evolution of Microcomputer, Special Purpose & General purpose Software Microcomputers.

References:

1. Fundamentals of Computers -By V. Rajaraman (Pill Publications)
2. Computer Fundamentals -By B. Ram

V Semester Paper – 1(501)

Internet & its Applications

Unit I

The Internet: Basic Concept, Basic Requirements of hardware & software for using the, Internet, IP Addresses and Domain Name System, Installation and Use of Web Browsers, Customizing the browser, Finding information on the Internet, Search Engines.

Unit II

Uploading and Downloading Text and Images, Web Pages and Web sites, Downloading Software with the Browser, Installing Downloading software, Advanced Software Downloading, FTP, Telnet, Multimedia.

Unit III

E-mail, E-mail with Outlook, Outlook express, Eudora and Netscape Messenger, Advanced E-mail Facilities, Newsgroups: Use and Advantages, Online and e-mail Gaming, Chatting, Videoconferencing, Other Services on the Internet.

Unit IV

Security Issues on the Internet, Password Schemes, cryptography, Public and Private Key Encryption, Viruses, Worms and Other Nasties, Firewall, Session wall.

Unit V

A brief study of terms related to the Internet: HTML, URL, Gophers, Intranet, Extranet, WWW, Hypermedia, Developing one's own Website and its maintenance.

Text Book and References:

1. How to do Everything with the Internet: Dennis Jones
2. The Internet: Douglas E. Coiner, Prenlicc-Halllndia
3. Internet & Intranet Engineering : Daniel Minoli, lata McGraw-Hill

V Semester Paper –2 (502)
Numerical Methods

Unit-I

Errors in Numerical Calculation, Numbers and their Accuracy, Errors and their analysis, General Error Formula, Error in a series approximation.

Unitt-II

Solution of Algebraic and Transcendental Equations, Bisection method, Iteration method, Method of' False Position, Newton –Raphsan method, Muller's method, Quotient.-Difference method.

Unit-III

Interpolation, Errors in Polynomial Interpolation, Finite Differences, Newton's Formulae for interpolation, Central Difference Interpolation formulas, Interpolation with Unevenly spaced points, Divided differences and their properties, Inverses interpolation, Double interpolation.

Unit-IV

Curve fitting, Cubic splices and Approximation, Least Squares Curve fitting Procedures, Data fitting with cubic splines, Approximation of functions.

Unit-V

Numerical differential co and integration Trapezoidal Rule, Simpson's 1/3 rule, Romberg integration, Caucasian Integration, Numerical Double Integration.

Books Recommended:

1. Introductory Methods of Numerical Analysis: S.S.Sastry.
2. Numerical Analysis: B.D. Gupta.

VI Semester Paper –1 (601)
Software Engineering

UNIT I

The Product and the Processes: The Product :The evolving role of SW, Soft ware, Characteristics, Applications, Myths. The Process :Layered Technology, Process, Methods, Tools Fourth Generation Techniques ,etc.

UNIT II

Managing Software Projects: Project Management Concepts. Software Process and Project Metrics Software Project Planning. Risk Analysis and Management. Project Scheduling and Tracking, Software Quality Assurance, Software Configuration Management.

UNIT III

Conventional Methods for Software Engineering: System Engineering, Analysis Concepts and Principles, Analysis Modeling, Design Concepts and Principles, Architectural Design, User Interface Design Component-Level Design. Software Testing Techniques, Software Testing Strategies, Technical Metrics for Software.

UNIT IV

Object-Oriented Software Engineering: Object-Oriented Concepts and Principles, Object-Oriented Analysis Object-Oriented Design, Object-Oriented Testing, Technical Metrics for Object-Oriented Systems

UNIT V

Advanced Topics in Software Engineering: Formal Methods. Clelllrm Software Engineering. Component-Based Software Engineering, Client/Server Software Engineering, Web Engineering, Reengineering, Computer-Aided Software Engineering, The Road Ahead.

Text Book:

SOFTWARE ENGINEERING FIFTH EDITION BY PRESSMAN.

Reference:

1. Software Engineering by Soer ville
1. Software Engineering by Pankaj Jalote.

VI Semester Paper –2 (602)
Web Design

Unit -I

Getting Started: What is the Internet, The importance of the Internet, What is the Worldwide Web, What are Links or URLS, What is a web browser, What is a web server, Internet services. Designing your web site: The web flow, objective of the web site, Basic interface design, Developing a story board for the web site, Navigation and links within the site, Checklist for designing Creating a Web Page with HTML-The Basics: About HTML, Basic Elements Lists,

Unit II

Creating a web page with HTML-Linking: Linking HTML pages, Linking to URLs. Creating a web page with HTML- Text formatting: Text formatting, Text Alignment, Character styles, Fonts and Font size, Using colors for the web, Preformatted text, Horizontal lines, line break, displaying special characters. Adding Images and background to HTML pages.

Unit III

Tables: Tables in HTML; Frames: What are frames, creating frames, frame attributes and linking, Complex frame sets, Inline frames, Image Maps- What are image maps, Creating client side Image maps, Client/Server side Image maps.

Unit IV

Forms and CGI scripts-Form design, Additional layout features, CGI Scripting, what are active server pages. Embedding Multimedia and Java Applets, Inserting sound/audio into web pages, Video file formats, Creating Marquee, What is JAVA, Adding applets to web page. Java Script and dynamic HTML-.Java script, Structure of Java script, Basic commands of Java script, what is DHTML, DHTML in Netscape navigator, and DHTML in Internet explorer, Making DHTML work for both Internet Explorer and Netscape.

Unit V

Cascading style sheets: Defining style with HTML tags, Features of style sheets. Web Server-Locating a web server, FAQ to webmaster, keeping your file organized Using Directories, Moving file to web server, Commercial internet service, Setting up your own web server. Going Live-Testing and maintenance of the web site, Cross Browser testing and verifying links, registering and Indexing web site. site indexing using META Tags.

Text book: WEB PUBLISHIN by Monica D'Souza & Jude D'Souza.