

SEMESTER SYSTEM 2008
PROPOSED SYLLABUS FOR B Sc(CS) , B Sc(IT) AND B Sc(C.MAINT.)

CLASS -----> / SEMESTER	B.Sc.(CS) / B.Sc.(CMAIN.)	B.Sc.(IT)	CCE 30 %	MIN. MARKS	TERM END EXAM 70%	MIN. MARKS	TOTAL 100%	MIN. MARKS
FIRST SEM.	CS-1201 PROGRAMMING AND PROBLEM SOLVING THROUGH C LANG. – I	CS-1201 PROGRAMMING AND PROBLEM SOLVING THROUGH C LANG. – I	15	5	35	12	50	17
	CS-1002 FUNDAMENTALS OF COMPUTING	CS-1002 FUNDAMENTALS OF COMPUTING	15	5	35	12	50	17
	CS-1201A PRACTICAL ON C AND DCO	CS-1201A PRACTICAL ON C AND PC SOFTWARE	----	----	----	----	50	17
SECOND SEM.	CS-1202 PROGRAMMING AND PROBLEM SOLVING THROUGH C LANG. – II	CS-1202 PROGRAMMING AND PROBLEM SOLVING THROUGH C LANG. – II	15	5	35	12	50	17
	CS-1003 DIGITAL COMPUTER ORGANISATION	CS-2401 INTRODUCTION TO INFORMATION SYSTEM	15	5	35	12	50	17
	NA	CS-1501 OPERATING SYSTEM BASICS & PC PACKAGES	15	5	35	12	50	17
	PRACTICAL ON C AND PC SOFT.	PRACTICAL ON C AND WIN,UNIX	----	----	----	----	50	17
THIRD SEM. (FOR HONS.)---->	CS-2204 DATA STRUCTURE - I	CS-2204 DATA STRUCTURE - I	15	5	35	12	50	17
	CS-3605 WEB TECH. AND PROG	CS-3605 WEB TECH. AND PROG	15	5	35	12	50	17
	CS-2204A & CS-3605A PRACTICAL ON DATA STRUCTURE USING C AND WEB PROG.	CS-2204A & CS-3605A PRACTICAL ON DATA STRUCTURE USING C AND WEB PROG.,LAN ,WIN2000	----	----	----	----	50	17
	CS-3506 UNIX PROGRAMMING	NA	15	5	35	12	50	17
FOURTH SEM. (FOR HONS.)---->	CS-4209 DATA STRUCTURE - II	CS-4209 DATA STRUCTURE - II	15	5	35	12	50	17
	CS-2402 DBMS FUNDAMENTALS	CS-2402 DBMS FUNDAMENTALS	15	5	35	12	50	17
	NA	LAN AND WINDOWS 2000 ADMINISTRATION	15	5	35	12	50	17
	CS-4209 & CS-2402A PRACTICAL ON DATA STRUCTURE USING C AND WEB PROG.	CS-4209 & CS-2402A PRACTICAL ON DATA STRUCTURE USING C AND WEB PROG.					50	17
	CS-3507 SYSTEM PROGRAMMING		15	5	35	12	50	17

PS :- CCE ---- CONTINUOUS COMPREHENSIVE EVALUATION, INDIVIDUAL PASSING REQUIRED FOR THEORY AND PRACTICAL SUBJECT.

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CLASS /SEME STER	B.Sc.(CS) / B.Sc.(CMAIN.)	B.Sc.(IT)	CCE 30 %	MIN. MARKS	TERM END EXAM 70%	MIN. MARKS	TOTAL 100%	MIN. MARKS
FIFTH SEM.	CS-3207 OBJECT ORIENTED PROGRAMMING USING C++ – I	CS-3207 OBJECT ORIENTED PROGRAMMING USING C++ – I	15	5	35	12	50	17
	CS-3604 DATA AND NETWORK COMMUNICATION FUNDAMENTALS	CS-3604 DATA AND NETWORK COMMUNICATION FUNDAMENTALS	15	5	35	12	50	17
	CS-3207A & CS-3604A PRACTICAL ON C++	CS-3207A & CS-3604A PRACTICAL ON C++					50	17
	(FOR HONS.)	CS-3505 COMPUTER GRAPHICS AND MULTIMEDIA		15	5	35	12	50
CS-2502 OPERATING SYSTEM			15	5	35	12	50	17
CS-3206 PROG. IN VB AND VB.NET			15	5	35	12	50	17
CS-3505A PRACTICAL ON GRAPHICS AND MULTIMEDIA							50	17
CS-3206A PRACTICAL ON VB AND VB.NET							50	17
CS-3801A PROJECT PHASE - I						50	17	
SIXTH SEM.	CS-4208 OBJECT ORIENTED PROGRAMMING USING C++ – II	CS-4208 OBJECT ORIENTED PROGRAMMING USING C++ – II	15	5	35	12	50	17
	CS-3606 ADVANCE WEB TECH AND PROG.	CS-3606 ADVANCE WEB TECH AND PROG.	15	5	35	12	50	17
	NA	CS-3206 PROGRAMMING IN VB & VB.NET	15	5	35	12	50	17
	CS-4208A & CS-3606A PRACTICAL ON C++ AND WEB PROG.	CS-4208A & CS-3606A PRACTICAL ON C++ AND WEB PROG.					50	17
(FOR HONS.)	CS-3006 MICROPROCESSER AND ASSEMBLY LANG. PROG. CS-3303 INTRODUCTION TO SOFTWARE ENGINEERING CS-3210 JAVA PROG. CS-3006A & CS-3303A PRACTICAL ON ASSEMBLY LANG. & ONE CASE STUDY OF S/W ENG. CS-3210A PRACTICAL ON JAVA CS-3801B ROJECT PHASE - II		15	5	35	12	50	17
			15	5	35	12	50	17
			15	5	35	12	50	17
							50	17
							50	17

Detailed Syllabus of
B.Sc.(Computer Science) ,
B. Sc.(Computer Maintenance)
and
B.Sc.(IT)
Session - 2008

BSC - CS-1201
Programming and Problem solving through 'C'-I

Max. Marks: 35

Min. Marks: 12

Objective:

The objective of this course is to make the student understand programming language concepts, mainly control structures, reading a set of data, stepwise refinement, function, control structure and arrays. After completion of this course, the student is expected to analyze the real life problem and write a program in 'C' language to solve problem. The main emphasis of the course is on problem solving aspect that is, developing proper algorithms.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/analytical/theoretical) combination of subsection in each question.

Unit-I

Algorithm for problem solving: An Introduction, Properties of an algorithm, Classification, Algorithm logic, Flowchart.

Program design and implementation issues: programming, system design techniques, programming techniques, basic constructs of structured programming, modular designing of programs.

Programming environment: High level programming language, low level programming language, middle level programming language, Assembler, Compiler, Interpreter.

Unit-II

What is C: Historical development of C, where C stands, Getting started with C: The C character Set Types of C constants, Types of C Variables, C keywords, identifiers, literals.

C instructions: Type Declaration Instruction, Arithmetic Instruction, integer, long, short, signed unsigned, storage classes, Integer and Float Conversions, type conversion in assignment, hierarchy of operations.

Unit-III

Decision control structure: control instructions in C, if, if-else, use of logical operators, hierarchy of logical operators, arithmetic operators, relational operators, assignment operator, increment and decrement operators, conditional operators, bit wise operators, special operator "&, *, ., ->, size of".

Loop control structure: while loop, for loop, do-while loop odd loop, nested loop, break, continue, case control structure, goto, exit statement.

Unit-IV

Arrays: what are arrays, array initialization, bound checking, 1D array, 2D array, initialization of 1D and 2D array, memory map of 1D and 2D array, multidimensional array.

Strings: What are strings, standard library string functions: strlen(), strcpy(), strcat(), strcmp(), 2D array of characters.

Unit-V

Structure: Why use structure, declaration of structure, accessing structure elements, how structure elements are stored, array of structure, uses of structure.

Preprocessor: Features of C preprocessor, Macro expansion, Macro with arguments, file inclusion, conditional compilation, #if, #elif, miscellaneous directives, #undef, #pragma directives.

Books:

1. Programming with ANSI and Turbo C -kamthane- Pearson education
2. Let us C by Y Kanetkar (BPB)
3. Programming and Problem solving through 'C'. (ELSEVIER) (for UNIT I)
4. Programming in 'C'. E. Balaguruswami (TATA McGRAW Hill)
5. The C Programming Language by Brain W Kernigham and Dennis M Ritchie
6. Practical C programming, 3rd Edition (A Nushel Handbook) O' Reilly

BSC - CS-1002
Fundamentals of Computing

Max.Marks: 35

Min.Marks: 12

Objective:

Fundamentals of Computing provides a clear, concise introduction to the fundamentals of computer science. The course contents generate excitement, curiosity, and enthusiasm in students to learn more about the fascinating world of computing.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit-I

What is Computer Science, Evolution of the Computer, importance of computers, van Newman model of computer , Block diagram of computer, generation of computer, computer for individual users(define) - desktop, workstations, notebook, tablet pc ,handheld pc and smart phone, Computer for organization(define) - network servers, mainframe computers, mini computers and super computer, Define power PC.

Unit-II

Types of software and their uses, types of programming languages. Number Systems - Decimal , Binary , Hexadecimal and Octal and conversion of all number systems , character coding system - BCD Codes, ASCII and EBCDIC and Gray code.
Computer word.

Unit-III

Fixed point representation - integer storage, largest integer storage, Negative integer storage representation , floating point representation, overflow and underflow.

CPU organization , function of CU, function of ALU, CPU instruction, types of Buses, size of cpu registers - program counter, memory address register, memory data register, Accumulator.

Unit-IV

Input-Output devices - Architecture of keyboard, mouse, light pen, video input(touch screen), joystick, track(space) ball, micr, ocr, omr, webcam scanner,types of monitor, plotter, types of printer. Voice output device.

Memory - types of primary(main) memory, types of secondary memory, cache memory, physical and Virtual memory, types of optical memory, RAM disks.

Unit -V

Addressing modes - Direct addressing, Indirect addressing, Indexed Addressing, Immediate Addressing modes, Digital and Analog quantities, Binary digits,logic levels,digital wave forms - Timing diagram, Data Transfer, Basic logic operations, Digital integrated circuits - Introduction, IC packages and pin numbering.

1. Digital fundamenatals - Floyd & Jain - Pearson Education
2. Introduction to computers - Norton - McGraw Hill
3. computer fundamentals - B.Ram - New Age International
4. computer fundamentals - jaggi and jain

BSC - CS-1003

DIGITAL COMPUTER ORGANISATION

Max.Marks: 35

Min.Marks: 12

Objective:

The objective of this course is to cover the basic concepts of digital design in a clear, and concise manner. The basic building blocks needed for the design of a micro processor are covered

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit-I

Binary number - Addition, subtraction, multiplication and division,1s complement , 2's complement,9's complement,10's complement.

Logic Gates - Inverter, OR, AND, NOR, NAND, Exclusive OR , Exclusive AND ,Universal gate.

Unit -II

Boolean Algebra - definition ,boolean operation and expression, laws and rules of Boolean algebra, Demorgan's theorems.

constructing a truth table for logic gates and circuits, simplification circuits using Boolean algebra,

Unit -III

K-MAP for two,three and four variables, SOP form, POS form.

Half adder and Full adder.

Flip Flop - latches, RS , Master slave, D and T flip flop.

Unit - IV

Multiplexer, DeMultiplexer, Encoder , Dcoder and their Applications.
Registers - types of shift registers and types of Counters.

UNIT - V

Microcomputer Organisation, microprocessor organization, instructions, stack subroutine and interrupt.

Memory organization, input-output interface, DMA- control signals for DMA transfers, Block diagram of DMA controller, DMA transfer in a microcomputer system.

1. Digital fundamenatals - Floyd & Jain - Pearson Education
2. Introduction to computers - Norton - McGraw Hill
3. computer fundamentals - B.Ram - New Age International
4. Digital fundamenatals - Floyd & Jain - Pearson Education
5. computer fundamentals - jaggi and jain
6. Digital logic and computer design - morris mano - PHI

BSC - CS-1202

Programming and Problem solving through 'C'-II

Max. Marks: 35

Min. Marks: 12

Objective:

The objective of this course is to make the student understand advanced programming language concepts, and apply those concepts to solve complex real-life problems. Also, the advanced topics in C language, like pointers and files are to be covered.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit-I

Functions: what is function, why use function, passing values between functions, scope rule of functions

Advance features of function: function declaration and prototypes, call by value, and call by reference, back to function calls, macro verses function, Recursion, need of recursion, types of recursion.

Unit-II

Pointers: what is pointer, pointer assignment, pointers and arrays, passing entire array to function, pointers and 2D array, pointers array, pointer to array, array of pointers to string, pointer to structure, use of pointer, malloc, calloc library functions.

Unions: union definition and declaration, accessing a union member, union of structure, initialization of a union member, uses of union, use of user-defined datatypes

Unit-III

Types of I/O, Console Input/Output functions: formatted console I/O functions, sprintf() and sscanf() functions, unformatted console I/O functions

Disk I/O functions: File opening modes, writing closing file(fclose), a file copy program, using argc, argv, string I/O in in files, formatted disk I/O functions, text versus binary mode, record I/O in files, detecting error in reading and writing, I/O redirection in DOS.

Unit-IV

Component of VDU: Display Adapters, Display screens (monitor), Video display modes, Resolution Text or Graphics: Colors in text mode, Colors in graphic mode, Video pages, Writing to VDU memory in text mode

Unit-V

Graphic programming: Lines, Stylish lines, Drawing and filling images, Patterns with a differences, bar() Filling regular and non regular shapes, of palettes and colors, outputting text, Justifying text, A bit of animation, System metrics, CPU Registers, Mouse Programming

Books:

1. Programming with ANSI and Turbo C -kamthane- Pearson education
2. Programming in 'C'. E. Balaguruswami (TATA McGRAW Hill)
3. Programming and Problem solving through 'C'. (ELSEVIER)
4. First Course in Programming with 'C'. T. Jeyapowan (VIKAS)
5. The C Programming Language by Brian W Kernighan and Dennis M Ritchie
6. Practical C programming, 3rd Edition (A Nushel Handbook) O' Reilly

BSC - CS-2401

Introduction to Information System

Max. Marks: 50

Min. Marks: 17

Objective:

The objective of this course is to cover the structure of an organization, importance of information and the systems needed for effective capture, store, retrieve, process and analyze information.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit-I

Information concepts, system & modeling concepts, what is information system, business information system, system development, need to learn information system, organization & information system, competitive advantage, performance based information system, careers in information systems.

Unit-II

H/W: Component, processing & memory devices, secondary storage, input and output devices
S/W: Overview of S/W, system & application S/W, programming languages, S/W issues & trends

Unit-III

Data management, data modeling and database models, database management systems, database applications

Unit-IV

Overview of Communication systems, telecommunication, network & distributed processing, telecommunication & application

Use & functioning of the Internet, Internet services, WWW, intranets & extranets, Net issues

Unit-V

Introduction to E-Commerce, types of e-commerce, e-commerce application, Electronics Payment System, technologically infrastructure of E-Commerce, trends to E-Commerce, strategy for successive E-Commerce

Computer Waste and Mistakes, computer crimes, privat..?, work environment

Books:

1. Principal of Information System: Ralph Stair (Thomson course technology)

B.Sc - CS-1501

OPERATING SYSTEM BASICS & WORD PROCESSOR

Objective:

The objective of this course is to make student learn the basic functions & structure of operating systems and various commands & operations.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit - I

Evolution of an operating system, Define Operating system, objectives and functions of an operating system, the operating system as a resource manager, types of an operation system. Differentiate Dos, windows and linux/Unix.

Introduction to Windows-XP : Windows XP features, windows Desktop Setting, managing windows explorer.

UNIT -II

Windows-XP: Using Taskbar, Start Menu options, My Computer, Recycle Bin, My Network Place, My Documents.creating user Accounts in win-XP.

Windows Accessories: - Calculator, Note Pad, Word Pad, Paint, Entertainment, Address Book.

Unit - III

Control Panel: Installation of Software ,Addition of new hardware, installation of modem, Sound card, Printers and Scanner, Date and time, taskbar and start menu.

Windows Explorer: Creating a new folders and other explore facilities,changing the look and feel of windows(desktop,wallpaper,screen saver etc.).

Unit - IV

Linux: Features, Structure of file system, Linux system architecture(Kernel and Shell).

Linux Command: - How to create and manage a text file in linux, cat, pwd, ls, mkdir, cd, , rm, rmdir, cp, who, mv, tty, sty, chmod.

Utilities: more, file, cmp, comm., diff, passwd, uname, cal, bc.
Filter and Pipe: pr, head, tail, grep, egrep, frep, tr.

Unit - V

MS-WORD: Define word processor ,types of word processor,creating document in MS word,formatting features of MS-word, word standard toolbar ,text formatting, header and footer, auto text,document security features,table handling features, insertion of files and pictures ,mail merge and macros.

Books:

1. Microsoft windows XP STEP BY STEP - PHI
2. operating system - William stallings - pearson education
3. Unix operating System - sumitabha das - Tata McGraw hill
4. Introduction to computers - Norton - McGraw Hill

CS-2204 - DATA STRUCTURES-I

Max. Marks: 35

Min. Marks: 12

Objective:

To explore abstract concepts and learning to apply these concepts in problem solving. It covers the techniques of data representation to improve the efficiency of operations performed over the data.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/analytical/theoretical) combination of subsection in each question.

Unit-I

Introduction to Data-structures : Definition of data structures and abstract data-types.

Classification of Data-structures : Linear, Non-linear, Homogeneous, Non-homogeneous, Static and Dynamic data structures.

Levels of Data-structures : User level(view-level), logical level, Physical level.

Arrays : Definition, representation of One and Two dimensional arrays in memory (address calculation).

Sparse Matrix : Definition, Memory Representation

Unit-II

Stack : Definition, Array implementation of stack (static stack) : Operations PUSH, POP, TRAVERSE .

Applications of stack : Infix, Prefix , Postfix representation and conversion using stack, Postfix expression evaluation using stack, use of stack in recursion implementation.

Queue : Definition, array implementation of queue (static queue) : Operations INSERT, DELETE, TRAVERSE.

Applications of queue : Network Printer, Simulation of an Airport, Time Sharing System(Round Robin Scheduling)

Comparisons of array, stack and queue data structures.

Introduction to Circular queue, priority queue, Double ended queue, multiple queue.

Unit-III

Pointers : Introduction, Pointers to structures, malloc, calloc functions.

Linked list : Singly and Doubly Linear link lists, Singly and doubly circular linked list : Definitions, operations INSERT , DELETE, TRAVERSE on all these list.

(Insertion operation includes - insertion before a given element, insertion after a given element, insertion at given position, insertion in sorted linked list)

Implementations of Stack and Queue using linked list (Dynamic stack).

Unit-IV

Applications of linked list :

String representation & string operations like string length, string reverse, string comparison, string concatenation, string copying, convert upper-case to lower and vice-versa, substring using linked list.

Polynomial representation and addition of two polynomial using linked list.

Josphus problem, searching using linked list, sorting using linked list.

Unit-V

Simple Searching Algorithms: Linear or sequential search, Binary search, interpolation search using array.

Simple Sorting Algorithms: Bubble sort, Selection sort, Insertion Sort on array.

Introduction to Complexity: Definition, types of complexity: best-case, worst-case, average-case. Complexity of Linear search, Binary search, Interpolation Search, Bubble sort, selection sort, Insertion sort.

Reference Books:

1. Introduction to Data Structure in C-Ashok Kamthane-Pearson Education
2. Data Structures and Program Design in C Robert H. Kruse, Bruce P. Leung PHI Publications.
3. Data Structures (Schaume's Outlines) By Lipschutz TMH Publications.
4. Data Structures and Algorithm in C++ By Adam Drozdek Thomson (Vikas)
5. Data Structures using C & C++ By Aaron M. Tenenbaum, Yedidyah Langsam PHI publications.
6. Data Structures In C++ By Ellis Horowitz, Sartaj Sahani, Dinesh Mehta Galgotia Publications.

CS-3605 - Web Technology and Programming

Max. Marks: 35

Min. Marks: 12

Objective:

To introduce the concept of Web Technology and Internet.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit-I

Concept of the point to point and Broadcast Network, OSI Reference Model, Bus, Ethernet LAN, FDDI LAN, Token Ring, Star, Hub, WAN, MAN, TCP/IP, Routers, Gateways, Bridge, Switches, Subnet, Internet & Intranet, Introduction to TCP/IP and Shell Account Internet Addressing

Unit-II

Concept of ISP(Internet Service Provider), Internet Backbones, NAPs, Concept of URL Address, Domain Names, Hypertext Concepts and World Wide Web, FTP, NNTP. The Email Electronic Post Service, SMTP, Configuring a Computer for an email, Free E-mail sites and setting e.g. hotmail, mail city, email with additional features, websites.

Unit-III

Web server and proxy server, Web caches, FAQs, Web browse like Internet Explorer, Netscap Navigator, Netscap Communication Suit, Internet Viruses, Internet security issues, Embedded and S/W based firewall, Data encryption and Digital signatures and certificates.

Unit-IV

The art of creating the website and home page, The HTML programming basics, Syntax and rules, Tables, Frames, Forms, Example of HTML page, Choice of page color, banners, Linking with HTML page, Div, Span, metatags, span.

Unit-V

The search and search engine for internet, Spidders, Robotos, Botes, Internet Agents, mobile agents, meta search sites, outlook express and front page.

Books:

1. Web Tech.: A Computer Science Perspective-Jeffrey C. Jackson
- Pearson Education
2. Internet the complete reference - Sybex Pub.
3. Computer Networks - A. S. Tanunbum.
4. The latest reference, please note as follows no. of information technology and internet and web technology books are expected from leading publishers, Tata Mc-Graw Hill, Addition Wisley, Thomson learning etc.

CS-3506 - UNIX PROGRAMMING (FOR HONS. COURSE ONLY)

Max. Marks: 35

Min. Marks: 12

Objective:

To introduce the concept of **Unix/Linux** Operation and Introductory programming of Shell & Scripting Language.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

UNIT - I

History of Unix, philosophy, features of Unix, Advantages and Disadvantages, Basic Architecture of Unix/Linux system, features of Kernel and Shell. *Unix File system* - Boot block, super block, Inode table, data blocks, How Unix/Linux kernel access files, Unix/Linux standard file system.

Unit -II

Structure of file system, Essential Linux commands - Commands for files and directories creating and viewing files using cat, cd, ls, cp, md, rm, mkdir, rmdir, pwd, file, more, less, file comparisons - cmp & comm, View files, disk related commands, checking disk free spaces, chmod with its options, cal,date,who,TTY, lp,TTY.

Unit -III

Filters and pipes : head, tail , wc, pr, cut, paste, sort, unqiue, grep, egrep, fgrep ,tee,
The process : shell process, parent and children ,process status, system process, multiple jobs in background and foreground, changing process priority with nice, premature termination of process, Mathematical commands- bc, expr, factor, units.

Unit -IV

Creating and editing files with VI editor with their command options, Operators, text deletion, text movement, changing text, yanking text, filtering text, the ex mode, moving text from one file to another.

Communication: The bulletin board -news ,write , mesg , talk, mail, elm, pine, finger, vacation and connecting to remote machine.

Unix - V

System administration Common administrative tasks, identifying administrative files - configuration and log files, Role of system administrator, Managing user accounts-adding & deleting users, changing permissions and ownerships, Installation of Unix/Linux system - Unix/Linux Installation requirement, complete Procedure steps, Partitioning the Hard drive, System startup and shut-down process, init and run levels. File system mounting, lpstat, backup strategy, installing software on Unix/Linux.

Reference Books:

1. Unix - syed mansoor sarwar, Robert kortskey - Pearson Education
2. Unix concepts and Application- Sumitabha Das-Tata McHill
3. Using Linux - David Bandel and napier - Pearson Education

CS-4209 - DATA STRUCTURES-II

Max. Marks: 35

Min. Marks: 12

Objective:

This course is about methods of data structure design and analysis that lead to efficient data structures for a variety of problems. The focus is on recursion, graphs, hashing & advanced sorting techniques so that, the student understand the basic technique of algorithm design and the impact of data representation over these techniques.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/analytical/theoretical) combination of subsection in each question.

Unit - I

Introduction to Functions : Simple functions, Recursive functions, types of recursion, uses of recursion, methods to avoid recursion.

Trees : Definition, Binary tree : definition, representation, operations : insertion, deletion, and traversal : preorder, inorder , postorder (recursive and non recursive-using stack), Binary search tree (BST) : definition and creation, search using BST.

Count number of leaf nodes, total number of nodes in binary tree, conversion of General tree to Binary tree, forest.

Unit - II

Graph : Definition, types of graph - Directed, Non-directed, weighted, connected , strongly connected, weakly connected , non-connected, cyclic, acyclic.

Adjacency of graph: Definition, adjacency matrix and adjacency list representation of directed graph and non-directed graph.

Graph traversal: Depth First Search (DFS), Breadth First Search (BFS) algorithm.
Minimum Spanning Tree: Prim's Algorithm, Kruskal's Algorithm.
Shortest Path Algorithm: Dijkstra's Algorithm.

Unit - III

Hashing : Definition of Hashing, Hash function, Collision, Overflow, Symbol table or Hash table, Hashing as a search technique.

Collision resolution and overflow handling techniques: Open Addressing - linear probing and quadratic probing, Rehashing, Chaining.

Methods for uniform Hash function: Mid-Square, Division, Folding, Digit Analysis.

Advance Trees: Definition of Height Balance Tree (AVL), rotations in AVL tree, Definition of Multi-way Search Tree, B-Tree, B+ tree, Splay tree, Red-Black Tree.

Unit - IV

Advance Sorting :

Quick Sort: Algorithm, Program, Demonstration, Analysis of quick sort.

Heap sort: Creation of Heap (MAX heap, MIN heap), Sorting using heap.

Shell Sort and Merge Sort : Algorithm, Program and Demonstration

Recursive Algorithms and Program for Linear Search and Binary Search. Linear Search in Link list.

Unit - V

Analysis & Complexity of Algorithms:

Define - Computational Complexity, Asymptotic Complexity, Amortized Complexity, Big-O notation.

File-Organization: Define File, Record, Fields, Fixed size record, Variable size records, Various file Organizations: Sequential, Indexed Sequential, Random and Relative file Organization.

Reference Books:

1. Introduction to Data Structure in C-Ashok Kamthane-Pearson Education
2. Data Structures (Schaume's Outlines) By Lipschutz TMH Publications.
3. Data Structures and Program Design in C Robert H. Kruse, Bruce P. Leung PHI Publicatios.
4. Data Structures and Algorithm in C++ By Adam Drozdek Thomson (Vikas)
5. Data Structures using C & C++ By Aaron M. Tenenbaum, Yedidyah Langsam PHI publications.
6. Data Structures In C++ By Ellis Horowitz, Sartaj Sahani, Dinesh Mehta Galgotia Publications.

CS-2402 - DBMS FUNDAMENTALS

Max. Marks: 35

Min. Marks: 12

Objective:

To introduce the concept of DBMS and SQL.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit - I

Fundamentals- Data, Data Versus Information, Metadata, Files - sample file, records and fields, Master and Transaction data, Computer file, sequential file organization, Indexed organization, Direct organization, Traditional file processing system and its disadvantages, Define DBMS, Database System Architecture, File management system(FMS), FMS versus DBMS, Physical Data Organisation.

Unit - II

Database Development Process - Database Development within Information System Development, Information System Architecture, information system engineering, information system planning, database development process, define Database Application, Range of Database Application, Advantage of database approach, component of database environment.

DBMS Basics - Internal process, table, rows and columns, SQL and its power - DDL, DML, multiple tables and joins, Nested queries, DCL, levels of DBMS.

Unit - III

Introduction to DBMS - DBMS Models, Data names and definitions, The E-R Model notation, Basic construct of the E-R Model - Entity, Relationship and Attribute, Degree of Relationship, Cardinality Constraints, Enhanced Entity- Relationship (EER) Model.

Unit - IV

Relational Model - Relational database primer, Codd's Rule, Relational database characteristics, Relational Algebra operators, Relational calculus, Database integrity - constraints, Keys (all), Keys and SQL, Entity and referential integrity, Views. Normalisation and Normal forms - 1NF, 2NF, 3NF, BCNF, 4NF, 5NF, Denormalization.

Unit - V

SQL - Role of SQL in a Database Architecture, Defining a Database in SQL, Inserting, Updating and deleting Data, Internal Schema Definitions in RDBMS, Processing single tables, Clauses of SELECT statement, Using Expression, functions, wildcards, comparison and boolean operators, ranges, distinct, the GROUP BY clause, the HAVING clause, Processing multiple tables - equi join, natural join, outer join, union join, Data Dictionary facilities, Embedded SQL, Dynamic SQL.

Reference Books:

1. Modern Database system by Mcfadden
2. Introduction to Database Management System - Atul Kahate - Pearson Education
3. Modern Database Management - Jeffrey A. Hoffer, Mary & Fred - Pearson Education
4. Database system concept - A.Silberschatz, H.F. Korth

**CS-3507 - SYSTEM PROGRAMMING
(FOR HONS. COURSE ONLY)**

Max. Marks: 35

Min. Marks: 12

Objective:

To introduce the Basic concept of SYSTEM PROGRAMMING methodology.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit - I

Background - Introduction, System Software and Machine Structure, The Simplified Instructional Computer (SIC), Traditional (CISC) Architectures, RISC Architectures.

Unit - II

Assemblers - Basic Assembler Functions, Machine-Dependent Assembler Features, Machine-Independent Assembler Features, Assembler Design Options, Implementation Examples.

Unit - III

Loaders and Linkers -

Basic Loader Functions, Machine-Dependent Loader Features, Machine-Independent Loader Features, Loader Design Options, Implementation Examples.

Unit - IV

Macro Processors - Basic Macro Processor Functions, Machine-Dependent Macro Processor Features, Machine-Independent Macro Processor Features, Macro Processor Design Options, Implementation Examples.

Unit - V

Compilers - Basic Compiler Functions, Machine-Dependent Compiler Features, Machine-Independent Compiler Features, Compiler Design Options, Implementation Examples.

Reference Books:

1. System Software: An Introduction to Systems Programming, 3/E - Leland L. Beck - Addison-Wesley
2. System Programming - J.J.Donavan - Tata McGrahill
3. System Programming and operating system - D.M. Dhamdhare -Tata McGrawhill

CS-2504 - LAN AND WINDOWS 2000 ADMINISTRATION

Max. Marks: 35

Min. Marks: 12

Objective:

To introduce the Practical networking of LAN and WINDOWS 2000.

Examination:

The External examination will be of 35 marks. The question paper will contain questions equally distributed in all units. The balance of the paper will be maintained by including appropriate (Numerical/objective/conceptual/ analytical/theoretical) combination of subsection in each question.

Unit - I

Define network, classification of network - LAN, WAN and MAN, Topologies, Other types of Networks - VAN, Wireless, Backbone, Hybrid Network, Interconnecting networks, Definition of Architecture and standard, Advantages and Disadvantages of standard.

Unit - II

LAN - Introduction, component of LAN, Characteristics of LAN, Architecture - Peer to Peer networks, Client/Server networks, LAN Applications, LAN standards.

Unit -III

LAN Access control, MAC protocols, LAN topologies - physical and logical, LAN media and cabling, LAN transmission techniques, LAN hardware - NIC, Hubs, Repeaters, Bridges, Switches, Routers, Brouters, Gateways.

Unit - IV

LAN selection criteria, LAN performance, Basic requirement for installation of LAN, Installing a LAN, Managing the LAN, LAN softwares, LAN security.

Unit - V

Windows 2000 - Origin of Win2K operating system, Architecture -user mode, kernel mode, win2K features, Basic hardware requirement, Planning Namespace and Domains, procedure for installation of win2K, Dual boot consideration, Troubleshooting Installations, configuring windows 2K server- devices, networking, Server tool, DHCP , WINS server.

Reference Books:

1. Computer Networking - Stanford H. Rowe, Marsha L. Schuh - Pearson Education(LPE)
2. Microsoft win 2000 server Administrator's companion - Russel and Crawford - Prentice Hall India
3. *High Speed LANs Handbook* - S. Saunders, - *The McGraw-Hill*, 1996.
4. *Local and Metropolitan Area Networks* - W. Stallings - Fifth Edition, Prentice-Hall, 1997.