

DCS – 401 : DATA STRUCTURES USING 'C'

Credits: 4

Semester-IV

Module No.	Contents	Teaching Hours
I	<p>Introduction to data structure:- Data Representation, Abstract data Types, Data Structure and Structured Types, Difference between Abstract Data Types, Data Types And Data Structures. Data Types, Linear data type, Non- Linear data type, Primitive data type, Non primitive data type.</p> <p>Principles of programming and Analysis of Algorithms:- Algorithms, Different approaches for designing an algorithm, Complexity, Big 'O' Notation, Algorithm analysis.</p> <p>Stacks:- Introduction, Stacks as an Abstract Data Type, Primitive operations of stacks, Representation of Stacks through Arrays.</p>	12
II	<p>Linked List:- Introduction, Terminologies Node, Address, Pointer, Information, Next, Null pointer, Empty list etc. Operations on list Searching, Insertion and Deletion, Types of lists Linked list and Circular list, Array stacks, queues, implementation using list.</p> <p>Queues:- Introduction, Queue as an Abstract Data Type, Representation of Queues, Operations on queue: Searching, Insertion, Deletion. Circular Queues, Application of Queues.</p>	12
III	<p>Trees:- Introduction to Binary Trees, Basic Definition of Binary Trees, Operations on Binary Search Tree, Type of Binary tree, Height balanced and Weight, balanced tree, Operations on trees, Searching Depth-first search and Breadth - first search, Traversing Pre-order, In-order and Post-order, Insertion, Deletion.</p> <p>Graphs:- Introduction to Graphs, Terms Associated with Graphs, Terminology graph, node (vertices), arcs (edge), directed graph, in-degree, out-degree, adjacent, successor, predecessor, relation, Weight, path, length, Sequential Representation of Graphs, Linked Representation of Graphs, Traversal of Graphs, Spanning Trees, Shortest Path, Application of Graph.</p>	12

Reference books:-

1. "An introduction to data structures with Applications" by J. Tremblay, P. Soresan, Tata McGraw-Hill.
2. "Data Structures and Algorithms" by A. Aho, J. Hopcroft, J. Ulman, Pearson Education, 1998.
3. Data Structure Using C by ISRD Group New Dehli, Tata Magraw Hill

DCS – 402 : OBJECT ORIENTED PROGRAMMING

C++

Credits: 04

Module No.	Contents	Teaching Hours
I	<p>Concept of Object Oriented Programming:- History & features: It's need & requirement, procedure oriented programming versus object oriented programming, basic concepts object oriented programming, object oriented languages. Beginning with C++: Concepts & structure of C++ programming, concepts of structure. Objects & classes:- Specifying a class, Defining member functions, Arrays within a class, Creating objects, memory allocation for objects, static data & member function, Arrays of objects, objects as function argument.</p>	12
II	<p>Constructors and Destructors:- Concept of Constructor (Default, Parameterized, copy), Overloaded Constructors, Constructor with default argument, Destructors. Function overloading, Operator overloading (overloading unary & binary operators), rules for overloading operators. Inheritance:- Concepts of inheritance, Derived classes, Member declaration (Protected), Types of inheritance (Single, multilevel, multiple, hierarchical, Hybrid inheritance), Virtual base classes, Abstract classes, Constructors in derived classes, Member classes. Polymorphism:- Concepts of polymorphism, types of polymorphism, Overloading & overriding, Virtual function, Static & dynamic binding.</p>	12
III	<p>Pointers in c++:- Concepts of pointer (Pointer declaration, pointer operator, address operator, pointer expressions, and pointer arithmetic), Pointers & functions (Call by value, call by reference, pointer to functions, passing function to another function), Pointers in arrays (Searching, insertion & deletion), Pointers to string (Searching, finding length, comparison, concatenation, reverse), Pointers & objects (Pointers to objects, this pointer, and pointer to derived classes). Basic function of I/O system basics & File Processing:- Stream classes, using formatted & unformatted functions, using manipulator to format I/O, Basics of file system, opening & closing a file, reading & writing character from a file (get, put, get line, write), Command line arguments.</p>	12

REFERENCE BOOKS:-

1. C++ The complete reference by Schilt, Tata McGraw Hill.
2. Object oriented programming with C++ by Balgurusamy, Tata McGraw Hill
3. Object oriented programming in by Lafore Robert, Galgotia

DCS – 403 : LINUX OPERATING SYSTEM

Credits: 04

Semester-IV

Module No.	Contents	Teaching Hours
I	Introduction History of Linux and Unix, Linux Overview, Linux releases, open linux ,Linux Commands and Filters Mkdir, CD, rmdir, pwd, ls, who, whoami, cat, more, fail, head, concept of, mv, chmod, grep,wc, 540mm.., split, sort, diff, kill, write, wall, merge, mail, news Shell The command line special characters and file arguments, standard input/output and redirection, pipes, redirecting and piping with standard errors, shell scripts, jobs.	12
II	Linux file Structure:-Linux files, file structure, listing displaying and printing files, managing directories, file and directory operations. Vi Editor, Vi editing commands, advanced Vi editing commands, line editing commands, options in Vi.	12
III	System Administration:-System management, managing users, installing and managing devices, floppy disk management, file system administration, backups.	12

REFERENCE BOOKS:-

1. Maurice J. Bach, "Design of the Unix Operating System", Pearson Education,2008.
2. Sumitabha Das, "Unix : Concepts and Applications", Tata McGraw-Hill , 2008.
3. ISRD Group, "Basics of OS, UNIX and SHELL Programming" , Tata McGraw-Hill,2006.
4. Sarwar, Koretsky, and Sarwar, "Unix , The Text Book", Pearson Education, 2007.

SUPPLEMENTARY READING

1. Stephen Prata "Advanced Unix -A programmer's Guide"., BPB Publication, 2008.
2. Kochan S & Wood P, "Unix Shell Programming", Pearson Education, 2008.
3. Stevens W R, Rago S.A, "Advanced Programming in Unix Environment", Pearson Education, 2008.

DCS – 404 : COMPUTER ORGANIZATION

Credits: 04

Semester-IV

Module No.	Contents	Teaching Hours
I	<p>Hardware organization of computer system ,CPU organization : general register organization, stack organization, instruction ,formats(three address, two address, one address, zero address and RISC instruction).</p> <p>Addressing modes: Immediate, register, direct, in direct, relative, indexed.</p> <p>CPU Design: Micro programmed vs hard wired control.</p> <p>Reduced instruction set computers: CISC characteristics, RISC characteristics, and their comparison.</p>	12
II	<p>Memory organization Memory Hierarchy RAM and ROM chips, Memory address map, Memory connections to CPU. Auxiliary memory : Magnetic disks and magnetic tapes. Associative memory Cache memory Virtual memory Memory management hardware</p> <p>I/O organization : Basis Input output system(BIOS) ,Function of BIOS Testing and initialization, Configuring the system . Modes of Data Transfer Programmed I/O: Synchronous, asynchronous and interrupt initiated.</p>	12
III	<p>DMA Data Transfer:- Architecture of multi processor systems, Forms of parallel processing, Parallel processing and pipelines, basic characteristics of multiprocessor.</p> <p>General purpose multiprocessors:- Interconnection Networks : time shared common bus, multi port memory, cross bar switch, multi stage switching networks and hyper cube structures</p>	12

References Books:

1. Computer Architecture and Organisation by Moris Mano
2. Computer Architecture by J.P.Hayes
3. Structured Computer Organisation By Tanenbaum Andrew S, Ph

DCS – 405 : MANAGEMENT INFORMATION SYSTEM

Credits: 4

Semester-IV

Module No.	Contents	Teaching Hours
I	<p>Foundation of Information System:- Information Systems (Concept, Resources and Products, Activities), Management Information System (Definition, Role, Features) Importance of Management, Process of Management (Planning, Staffing Organizing, , Coordinating, Directing), Organizational Structure – Basic model of organization structure, Organizational Behavior, Management Information System Organization, Strategic Management of Business – Concept of corporate planning, Essentiality of Strategic planning, Development of Business Strategy, Types of strategies, Tools of planning, MIS Business planning. Applications in manufacturing sector (Personal Management, Financial Management, Production Management, Materials Management, and Marketing Management) Applications in Service sector (Airlines, Hotels, Hospitals, Banking Insurance, Utilities, and Finance.)</p>	12
II	<p>Characteristics of decision making process- Decision Support System (Concept, Components, Development, Risk) Management Information System and Decision Support System, Concept of Artificial Intelligence & Expert System. Data warehouse (Concept, Design, Organization and Management, Architecture, Implementation), Data in data warehouse ,Data Mining.</p> <p>Enterprise Resource Planning (ERP)- ERP (Basic features, Benefits ,selection, implementation) Enterprise Management System (EMS) & Management Information System (MIS) Customer Relationship Management (CRM) (Concept , Three Phases of CRM, Benefits , Challenges & Trends)</p> <p>Business Process Outsourcing (BPO):- BPO, Voice BPO i.e. Call Center, Non- Voice BPO, Challenges in BPO Management. Electronic Commerce Systems (E-Commerce)– Concept, Scope, B2C, B2B, C2C, E-Commerce Applications.</p>	12
III	<p>Viewing Versus Security:- Risks, Threats & Vulnerability, Assessing Risks. Common Controls (Physical, Electronic, Software, Management Controls), Common Threats (Natural Disasters Employee Errors, Computer Crime, Fraud, Abuse, Program Bugs) Ethical & Contractual Behaviors, Privacy, Access & Accuracy Issues, Property Issues.</p>	12

Reference Books:-

1. Management Information Systems by O'Brien, J.A.
7th ed. New Delhi : Tata McGraw-Hill Publishing Company Limited, c2006
2. Management Information Systems by Jaiswal, M.
New Delhi : Oxford University Press, c2004
3. Information System for Modern Management by Murdick, R.G
3rd.ed. New Delhi : Prentice Hall of India Private Limited, c1984
4. Management Information Systems : Managing the Digital Firm by Laudon, K.C.
8th ed. New Delhi : Pearson Educatio

DCS – 451 : Data Structure Lab

Credits: 2

Semester-IV

List Of Practical

Module No.	Contents	Teaching Hours
1	The addition of two matrices using functions	48
2	Inserting and deleting elements in array	
3	Push and pop operation in stack	
4	Conversion from in-fix notation	
5	The factorial of a given number using recursion	
6	Insertion and Deletion of elements in queue using pointers	
7	Insertion and Deletion of elements in circular queue using pointers	
8	Insertion and Deletion of elements in linked list	
9	Insertion and Deletion of elements in doubly linked list	
10	The linear search procedures to search an element in given list	
11	The binary search procedures to search an element in a given list	
12	sort techniques	
13	The selection sort techniques.	

DCS – 452 : OOP'S LAB

Credits: 2

Semester-IV

List Of Practical

Sr. No.	Contents	Teaching Hours	
1.	Programs to input & output data (Simple programs).	48	
2.	Programs to create object of class.		
3.	Programs to create arrays of objects.		
4.	Program to access static member variables.		
5.	Programs using object as function arguments using friend function.		
6.	Programs to define Class using constructor & destructor.(Default constructor, Multiple constructor, Copy constructor, Overloaded constructor).		
7.	Program using constructor with default argument.		
8.	Program to overload unary & binary operator.		
9.	Single inheritance & multilevel using protected member.		
10.	Multiple inheritance & virtual base class.		
11.	Program for pointers to arrays of integer.		

**DCS – 453 : COMPUTER ORGANIZATION
LAB**

Credits: 2

Semester-IV

List Of Practical

Module No.	Contents	Teaching Hours
1	List Of Practical To identify various components, devices and sections of Computer.	48
2	To Study of motherboards	
3	To interconnect the system unit with the video monitor, mouse and key board and test the operation of the computer.	
4	Identification of chipsets and functional aspects of different subsystems on each card	
5	To connect various add on cards and I/O devices to a computer motherboard and test their working	
6	Study of the bus system and identifying various signal lines	
7	To note the voltages and waveforms at various terminals in the I/O channel (Bus Slots) Study of peripherals used, their speeds and capacities	

