

ADCA (w.e.f June 2010-11)

I Year			Instructional System							Credits	Marks
Course Code	SLM Code	Name of the subject	PC P	A W	V G D	PD P	PE C	PP W	III L		
ADCA-1	C-101	Computer Fundamentals & Programming in C	√	√	√		√			4	100
ADCA-2	C-102	Internet & Web Designing	√	√	√		√			4	100
ADCA-3	C-103	Data Base Management System	√	√	√		√			4	100
ADCA-4	C-104	Data Structure Through C	√	√	√		√			4	100
ADCA-5	C-105	Object Oriented Programming & C ++	√	√	√		√			4	100
ADCA-6	-	Practical covering ADCA-1 to ADCA-5	√	√			√			10	250
Total										30	750

II Year			Instructional System							Credits	Marks
Course Code	SLM Code	Name of the subject	PC P	A W	V G D	PD P	PE C	PP W	III L		
ADCA-7	C-111	System Analysis & Design	√	√	√					4	100
ADCA-8	C-121	Computer Oriented Statistical & Optimization Methods	√	√	√					4	100
ADCA-9	C-120 C-130	(A) Operating System (B) Introduction to Assembly Language	√	√	√		√			4 2	100
ADCA-10	C-119	Computer Network	√	√	√					4	100
ADCA-11	C-108	Computer Organization	√	√	√					4	100
ADCA-12	C-107	Discrete Mathematics	√	√	√					4	100
ADCA-13	-	Practical covering ADCA-9 & ADCA-11					√			4	100
ADCA-14	-	Project							√	6	250
Total										36	950

I Year

COMPUTER FUNDAMENTAL AND PROGRAMMING IN C C-101

SECTION A

Number System: Decimal, Octal, Binary & Hexadecimal, Representation of Integer, fixed and floating points, character representation : ASCII, EBCDIC.

SECTION B

Functional Units of Computer : I/O devices, primary and secondary memories.

SECTION C

Programming Fundamental : Algorithm development, techniques of problem solving, flowcharting, stepwise refinement, algorithm for searching sorting exchange and insertion merging of order lists.

SECTION D

Representation of integers, character, reals, data types, constants and variables, arithmetic expression, assignment statement logical expression, sequencing, alteration and iteration, arrays, string processing, sub program, recursion, files and pointers testing and debugging of program.

INTERNET AND WEB DESIGNING

C-102

SECTION A : Internet and Networking Basics

Definition of Internet, Internet organization and committees, Internet, Growth of Internet, Anatomy of Internet ,Internet Application , Portals, Introduction about WWW, Definition of DNS (Domain Name System) , IP Address.

Definition of Networks, Types of Network , Topologies, PSTN , PSDN, VAN ISDN, PDNS, Wide Area Network

SECTION B : Networking Services and Protocols

Introduction about search engines (Mozilla, Netscape, Opra) Email, Introduction about mail protocol (SMTP, MME), X.25, Frame relay, PPP, NNTP, SMPT, etc.

OSI References method, TCP/IP model, FTP, HHTTP, HTTPS, Addressing in Internet (Class A,B,C,D,E) Definition of Ethernet, Intranet , Telnet, Wireless communication , Virtual Circuits, ISDN model, CSMA/CD , Explanation of all layers of OSI and TCP/IP Model.

SECTION C : HTML

Introduction about HTML, Tag, Types of Tags, Forms, Tables, Images insertion , in web page.

DATABASE MANAGEMENT SYSTEM

C-103

SECTION-A

Database Concept : What is Database? Need of Database , Function of the Database; Types Database; Relational Database Management System, Relational Model – Key Concept; Domain Constraint , Integrity Constraints; Foreign Key.

SECTION-B

Database Development Process, Database Modeling & Database Design. E-R Model, Attributes, Relationship, Logical Database Design, Normalization , First Normal Form, Second Normal Form, Third Normal Form, Translating E-R Diagram to Relation, Physical Database design.

SECTION-C

Relational Algebra & SQL Relational Database Commands. Data-types Create Table , Drop Table , Alter Table , Insert Table, Insert into , Delete from, Update , General Query Syntax (Select), Create View, Drop View, Set Operators – Union , Intersect , Minus Function, Group Functions, Join Sub Queries.

SECTION-D

Data Administration, Client/Server and Distributed Database. Data Administration Functions, Data Administration tools – Repositories , CASE Tools, Concurrency Control, Database Security , Database Recovery. Database Applications : Financial Systems, Marketing System, Foreign Trade , Inventory Information Systems

DATA STRUCTURE THROUGH 'C'
C-104

SECTION A

1. Problem solving concepts, top down and bottom up design structured programming.
2. Concept of data type and data structure, differences between data type and data structures, view of data structures at logical level, implementation level and application level, built-in-data structures and user defined data structures.

SECTION B

3. Concepts of dynamic variables, difference between static and dynamic variables, concepts of pointer variables.
4. Study of the following user define data structures using static and variables.
 - Built-in data structures like arrays, records.
 - User defines data structures like stacks, queues, linked. User defined data structures like stacks, queues, linked lists, circular linked lists, doubly linked list.

SECTION C

5. Non-linear data structures: trees, terminology of trees, concepts and applications of binary trees, tree traversal techniques and algorithms.

SECTION D

6. Sorting and searching algorithms and their efficiency considerations.
7. Considerations for choice of proper data structure.

OBJECT ORIENTED PROGRAMMING AND C++

C-105

SECTION A

OOP paradigm, Advantages of OOP, Comparison between functional programming and OOP approach, characteristics of object oriented Language objects, class, Inheritance, Polymorphism, and abstraction, encapsulation, Dynamic Binding, Message passing.

Introduction to C++, Identifier and Keywords, constants, C++ Operators, Type conversion, Variable declaration, Statement, expression, User defined data types, conditional expression (For, While, Do-While, Do-While) loop statement, breaking control statements (Break, continue).

SECTION B

Defining a function, types of functions, Inline functions, Call by value and Call by reference, Preprocessor, Header files and standard functions, Structures, Pointers and structures, Unions, Enumeration.

SECTION C

Classes, Member function, Objects, Array of objects, Nested classes, Constructors, Copy constructors, Destructors, Inline member functions, static class member, friend functions, Dynamic memory allocation.

Inheritance: Single inheritance, Multi – level inheritance, Hierarchical, Virtual base class, Abstract classes, Constructors in Derived classes, Nesting of classes.

SECTION D

Function overloading, Operator overloading, Polymorphism, Early binding, Polymorphism with pointers, Virtual functions, Late binding, Pure virtual functions, Opening and closing of files, Stream member functions, Binary file operations, classes and file operations, Random access file processing.

II Year

SYSTEM ANALYSIS AND DESIGN C-111

SECTION A

1.Introduction

Concepts of a systems, examples of systems, types of systems – open and closed, static and dynamic with examples.

2.Overview of system analysis and Design

System development life cycle, brief introduction to analysis, implementation and testing and maintenance.

SECTION B

3.Preliminary Investigation

Project selection, scope definition and preliminary investigation.

4.Feasibility study

Technical and economic and operational feasibility, cost and benefit analysis.

SECTION C

5.Requirement Specification and analysis

Fact finding techniques, data flow diagrams, data dictionaries, decision trees and tables.

6.Detailed Design

Module Specification, file design, database design.

SECTION D

7.Testing and Quality Assurance

Maintenance, unit and integration testing techniques, design objectives, quality factors such as reliability correctness etc.

8.User Education and Training

Issues in user education and training, method of educating and training the user.

**COMPUTER ORIENTED STATISTICAL & OPTIMIZATION
METHODS (C- 121)**

Unit-I:

Collection of Data, Sampling & sampling designs, Classification and tabulation of Data
Graphical representation of Data.

Unit-II:

Measure of Central values, measure of dispersal, Skew, moments and kurtosis correlation and regression.

Unit-III:

Probability & Probability and distributions (Normal, Poisson's, Binomial)

Unit-IV

Linear Programming, Graphical Methods, Simplex methods (Simple Applications)

Unit-V

Transportation problems, Assignments problems, Game theory.

OPERATING SYSTEMS (ADCA –C-120)

Unit - I

Operating Systems and Resource Manager, Operating system classifications, simple monitor, multiprogramming, timesharing, real time systems, multiprocessor systems, operating systems services.

Unit - II

File System : File supports, access methods, allocation methods-contiguous linked and index allocation; directory systems single level, tree-structure, a cyclic graph and general graph directory, file protection.

Unit - III

CPU Scheduling: Basic scheduling concepts, Process overviews, process states, multiprogramming, Schedulers, and Scheduling algorithms, multiple- processor scheduling.

Unit - IV

Memory Management: Bare machine approach, resident monitor, Partition, Paging and segmentation, virtual memory, demand paging.

Deadlocks : Deadlock Characterizations, deadlock prevention, avoidance detection and recovery.

Unit - V

Resource Protections : Mechanisms, Policies & domain of protection, Access matrix and its implementation, dynamic protection structures.

Case Study of Windows-NT: Design Principle; System components, Environment subsystem; File System, Programmer Interface.

Introduction to Assembly Language (C-130)

UNIT 1: Microprocessor Architecture

- Microcomputer Architecture
- Structure of 8086 CPU
 - The Bus Interface Unit
 - Execution Unit (EU)
 - Register Set of 8086
- Instruction Set of 8086
 - Data Transfer Instructions
 - Arithmetic Instructions
 - Bit Manipulation Instructions
 - Program Execution Transfer Instructions
 - String Instructions
 - Processor Control Instructions
- Addressing Modes
 - Register Addressing Mode
 - Immediate Addressing Mode
 - Direct Addressing Mode
 - Indirect Addressing Mode

UNIT 2: Introduction to Assembly Language Programming

- An Introduction of Assembly Language
- The Need and Use of the Assembly Language
- Assembly Program Execution
- An Assembly Program and its Components
 - The Program Annotation
 - Directives
- Input Output in Assembly Program
 - Interrupts
 - DOS Function Calls (Using INT 21H)
- The Types of Assembly Programs
 - COM Programs
 - EXE Programs
- How to Write Good Assembly Programs

COMPUTER NETWORKS (C-119)

Unit-I

Introduction: Uses of networks, goals and applications. OSI reference model. Example Network-Novell Network, ARPNET, NSFNET, The Internet.

Unit-II

The Physical Layer: Transmission media: Twisted pair, Baseband and Broadband coaxial cable, Fiber optics; Wireless Transmission: Radio transmission, Microwave transmission, Infrared and light wave transmission; ISDN services; Virtual Circuits versus Circuit Switching Transmission in ATM Networks, Paging System, Cordless Telephones, Cellular telephones; Communication Satellite.

Unit-III

The Data Link Layer: Framing, Error control, Flow control; Error detection and Correction; Protocols: Simplex stop and wait protocols, One bit sliding window, Using Go-Back n, Example: The Data Link Layer in the Internet.

The Medium access Sub Layer: Framing Static and Dynamic Channel Allocation in LANS and MANs; IEEE Standard 802.3 and Ethernet; IEEE standard 802.4 and Token Bus, IEEE 802.4 and token Ring; Bridges; Bridges from 802 x to 802 y, Transparent Bridges, Sources Routing Bridges.

Unit-IV

The Network Layer: Network layer design issues, shortest path routing. Flooding, Flow based routine, Broadcast routine, Congestion control and prevention policies; Internet working; connectionless Internet working, Tunneling Internet work Routing, Fragmentation, firewalls, IP address, Internet control protocols.

Unit-V

The Transportation Layer: The transport service; Transport protocols: Addressing, Establishing and releasing a connection; The internet transport protocols: TCP.

The Application Layer: Network Security, Electronic mail.

COMPUTER ORGANISATION

C-108

Section A

Number System, Binary arithmetic, Gray Code, BCD, Logical Gates, Boolean Algebra, K-Map simplification, SOP forms, POS forms, Half adder, Full adder, Flip-Flops (SR, JK, D & T), Counters, Registers.

Section B

Basic Computer architecture, Functional Organization, Register organization, Arithmetic and logic unit, pipeline, Central Processing unit, Instruction formats, Addressing modes, Data transfer and manipulation, Interrupts, RISC/CISC architecture.

Section C

Register transfer and micro-operations, Register transfer language (RTL), Arithmetic, Logic and Shift micro-operations, Micro-program Control Organization, Control memory, address sequencing, Micro-program sequencer, Addressing Mode.

Section D

Memory and storage; Processor V/s Memory speed, High-speed memories, Cache memory, Direct mapping Set Associative Mapping, Fully Associative Mapping, Associative memory, interleaved memory, Virtual memory and memory management hardware. Input/output Organization: Peripheral devices, I/O interface, Asynchronous Data Transfer : Strobe control, Handshaking Data transfer schemes (Programmed, Interrupt Initiated, DMA transfer), I/O processor.

DISCRETE MATHEMATICS
C-107

BLOCK 1: ALGEBRAIC STRUCTURES

Unit 1: Fundamental Concepts & Vectors

Groups, Rings, Fields, Spaces – Linear, Dependence of Vector, Linear Transformation, Bilinear forms, Eigen values and Eigen Vectors.

BLOCK 2: GRAPH THEORY

Unit 1: Fundamental Concepts ,Algorithm & Applications

Basic terminologies of graph theory, Multigraphs and weighted graphs, Path and circuits, Planar graphs, Trees and rooted trees, Spanning trees and cut sets, coloring covering and portioning, directed graphs, enumeration of graphs, ideas on graphs theoretic algorithm and applications.