

NORTH LAKHIMPUR COLLEGE (AUTONOMOUS)

SYLLABUS FOR

PGDCA PROGRAMME

| SEMESTER | COURE CODE | SUBJECT | L T P | CREDIT |
|----------|---------------|---------------------------------|-------|--------|
| I | CT-4-PGC-101 | FUNDAMENTALS OF COMPUTERS | 4 0 0 | 4 |
| | CT-4-PGC-102 | PC SOFTWARE | 3 1 0 | 4 |
| | CT-4-PGC-103 | PROGRAMMING AND PROBLEM SOLVING | 3 1 0 | 4 |
| | CT-4-PGC-104 | WEB PROGRAMMING | 3 1 0 | 4 |
| | CP-4-PGC-105 | LAB (ON PAPER 102, 103, 104) | 0 0 8 | 4 |
| II | CT-3-PGC-201 | DATABASE MANAGEMENT SYSTEM | 2 1 0 | 3 |
| | CT-3-PGC-202 | OBJECT ORIENTED PROGRAMMING | 2 1 0 | 3 |
| | CT-4-PGC-203 | DATA STRUCTURE AND ALGORITHMS | 3 1 0 | 4 |
| | CP-2-PGC-204 | LAB (ON PAPER 207, 208) | 0 0 4 | 2 |
| | CR-8-PGC-205 | PROJECT | 0 0 0 | 8 |

CT-4-PGC-101

FUNDAMENTALS OF COMPUTERS

Unit 1: Introduction to computer and information technology.

Brief history of development of computers, computer system concepts, capabilities and limitations, types of computers: Analog, Digital, Hybrid, general, special purpose, Micro, mini, mainframe, super computers, generations of computers, personal computers, Classification of Computers: Desk-top Workstations/ PCs, Mainframe, Super-Computer, Parallel computer;

Unit 2: Computer organisation and working:

Basic components of computer system, Input devices, output devices, storage devices.

Unit 3: Computer Hardware and Softwares:

Basic Hardware Concept, Need of softwares, types of software, system software and application software, programming languages, machine, assembly, high level, 4GL, their merits and demerits. Application software-word processing, spread sheet, presentation graphics, Database management software, Introduction to Computer virus

Unit 4: Number system

Binary, octal and hexadecimal; positive and negative numbers, fixed and floating point.

Books:

1. Introduction of Computer Sc. ITL ESL Pearson Education India

References:

2. Trainer T.N., Computers, 4th Edn, McGrawHill.

3. Rajaraman V., Fundamentals of Computers, 2nd Edn, PHI.

CT-4-PGC-102

PC SOFTWARE

Unit 1: MS-Windows

Introduction to windows, Advantage of windows, Control Panel, Windows Explorer, Accessories.

Unit 2: Software and Operating System: Software and its types, Introduction to Operating System, Functions of O/S, Types of O/S, Program Language Translators (Assembler, Compiler, Interpreter), Utility Programs, Communication Software, Computer Languages (Machine language, Assembly language, High level language), MS-DOS, Linux Basic.

Unit 3: Internet and Network Basics: Network, Types of networks, concept on Communication channel (Guided and Unguided), Internet, Topology, Internet Protocol, e-mail, Browser, ftp, http, WWW, Virus and Antivirus, Firewall, client server architecture.

Unit 4: Office Automation Softwares:

i) **Word Processor:** Creating & Editing Document, Auto-text, Autocorrect, Spelling and Grammar Tool, Page Formatting, Bookmark, Mail Merge, Macros, Tables, Save, Printing, Styles, linking, Using Template)

ii) **Spreadsheet:** Creating & Editing Worksheet, Formatting Operations, Formulas and Functions, Inserting Charts, Sorting, Filtering, Table, Validation, Goal Seek

iii) **Presentation Software:** Creating, Manipulating & Enhancing Slides, Inserting Charts, Word Art, Animations, Picture and Sounds, Inserting Sound and Video, Hyperlinks

Text Books:

1. Computer Science and Application, T.D.Malhotra, Sunil Malhotra

Reference Books:

2. Rajaraman V., Fundamentals of Computers, 2nd Edn, PHI.

CT-4-PGC-103

PROGRAMMING AND PROBLEM SOLVING

Unit I:

Notion of an algorithm, tools for design and analysis of algorithms - Flow chart, Decision table, Pseudocode. Concepts of m/c language and high level language.

Unit II.

Features of a high level language : Assignment statement, input-output statements; Expressions; data types; conditional statements, Iterative statements; Array data type and use of arrays; character data type and text processing; functional and procedural abstraction; Recursion; Pointer data type and simple applications of pointers.

Example algorithms: string processing, matrix operations, searching, sorting, etc. Documentation, Debugging.

Books:

1. Dromey, G: How to solve it by computer, PHI (EEE)
2. Gottfried B: Programming with C

CT-4-PGC-104

WEB PROGRAMMING

HTML Programming Basics

HTML, page structure, HTML Text, HTML Links, HTML document tables, HTML Frames, HTML Images, Multimedia, CSS

Scripting: PHP, Java Script

Books:

- 1. Head First HTML**
- 2. Head First JavaScript**
- 3. Head First PHP**

CP-4-PGC-105
LAB (C PROGRAMMING & Web Programming)

Practicals to be performed on pc Software, C programming and Web Programming.

CT-3-PGC- 201

DATABASE MANAGEMENT SYSTEM

Unit I: Databases and database users

Database System Concepts and Architecture: Data models, schemas and instances, DBMS architecture, database languages and interfaces, classification of DBMS

Unit II: Data Modeling Using E-R Model:

E-R model concept

Unit IV: Relational Data Models:

Relational model concepts, relational model constraints, update operations on relations, defining relations

Relational algebra

Relational database languages: SQL

Unit V: Database Design:

Functional dependencies and normalisation for relational database

Books:

1. Elmasri R, Navathe S.B., *Fundamentals of Database Systems*, Benjamin Cummings Publishing Company
2. Silberschatz A., Korth H.F., Sudarshan S., *Database System Concepts*, 3/e, McGraw-Hill (IE)

CT-3-PGC-202

OBJECT ORIENTED PROGRAMMING & DESIGN

Basics of Object Oriented Programming (OOP)

Introduction to OOP- difference between OOP and procedure oriented programming – Classes, Objects and Methods – Overview of Inheritance and Polymorphism.

Object Oriented Design

Trends in software design- Notation of objects- Hybrid design method- Separation of responsibilities – Responsibility driven design- design phases and tools- step by step design – Grady Booch approach.

Data Abstraction: Class, Object, Constructors, Destructors, Member allocations for objects, New and Delete operators.

Inheritance: Single, multiple, multilevel inheritance, hierarchical inheritance

Polymorphism: Compile time polymorphism, Runtime polymorphism, Abstract Class, Dynamic Method Dispatch, Final Members and Classes.

Books:

1. Herbert Shield: The Complete Reference to Java, Tata McGraw Hill

CT-4-PGC-203

DATA STRUCTURE AND ALGORITHM

Concept of Data type, Data object Data Structure and Representation, Abstract Data Structures, Introduction To Analysis of Data Structure and Algorithm.

Arrays as ADT, Implementation of arrays, Single dimensional and Multidimensional.

Stack as ADT, Implementation of Stack, Push and Pop Operations, conversion of Infix to Postfix Notation, Evaluation of Postfix Notation Recursion Using Stacks(Concept only)

Queues as ADT, Implementation of queues, Application of queues to pre-Emptive Scheduling in Transaction Processing, Circular queues Using Arrays.

Linked List as ADT, Singly Linked list, Operations on Linked List, Implementations of Stacks and queues using Linked list Doubly Linked Lists

Trees as ADT, Basic Terminology, Binary Tree Traversal In order, post order, Preorder (both recursive and non-recursive versions). Threaded Binary Trees, Traversal of Thread-ed Binary Trees, Binary Tree Representation of Trees

Searching: Linear Search, Binary search, Depth First Search and Breadth First Search on Binary Trees.

Sorting: Bubble sort, Insertion sort, Quick sort

Textbooks:-

1. Data structure Using 'C', by Tanenbaum.
2. Data structure, by Seymore Lipschutz

CT-2-PGC-204

LAB

Practicals are to be performed on Data Structure and OOP

PR-8-PGC-205

Tentative Area for Minor Project

1. Web Page Designing
2. Database Oriented
3. System Oriented
4. Information System