SEMESTER -III

Course Code	Course Name
0327001	Object Oriented Programming Using C++
0327002	Data Structure Using C & C++
0327003	Operating System concepts
0327004	Web Designing
0327005	Numerical Methods
0327080	Web designing, C++ & DS Lab

Course Name: Object Oriented Programming using C++

Course Code: 0327001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction : Introducing Object – Oriented Approach, Relating to other paradigms {Functional, Data decomposition}.

Basic terms and ideas: Abstraction, Encapsulation, Inheritance, Polymorphism, Review of C, Difference between C and C++ - cin, cout, new, delete, operators.

UNIT-II

Classes and Objects: Encapsulation, information hiding, abstract data types, Object & classes, attributes, methods, C++ class declaration, State identity and behaviour of an object, Constructors and destructors, instantiation of objects, Default parameter value, object types, C++ garbage collection, dynamic memory allocation, Meta class / abstract classes.

UNIT-III

Inheritance and Polymorphism: Inheritance, Class hierarchy, derivation – public, private & protected, Aggregation, composition vs classification hierarchies, Polymorphism, Categorization of polymorphism techniques, Method polymorphism, Polymorphism by parameter, Operator overloading, Parametric Polymorphism

UNIT-IV

Generic function: Template function, function name overloading, overriding inheritance methods, Run time polymorphism, Multiple Inheritance.

UNIT-V

Files and Exception Handling: Streams and files, Namespaces, Exception handling, Generic Classes

Referential Books:

- R.Lafore, "Object Oriented Programming using C++", Galgotia Publications, 2004 4. D.Parasons.
- "Object Oriented Programming using C++", BPB Publication.

Course Name: Data Structure Using C & C++

Course Code: 0327002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to Data Structure and its Characteristics Array

Representation of single and multidimensional arrays; Sparse arrays – lower and upper triangular matrices and Tri diagonal matrices with Vector Representation also.

UNIT-II

Stacks and Queues : Introduction and primitive operations on stack; Stack application; Infix, postfix, prefix expressions; Evaluation of postfix expression; Conversion between prefix, infix and postfix, introduction and primitive operation on queues, D- queues and priority queues.

UNIT-III

Lists: Introduction to linked lists; Sequential and linked lists, operations such as traversal, insertion, deletion searching, Two way lists and Use of headers

UNIT-IV

Trees: Introduction and terminology; Traversal of binary trees; Recursive algorithms for tree operations such as traversal, insertion, deletion; Binary Search Tree

UNIT-V

B-Trees: Introduction, The invention of B-Tree; Statement of the problem; Indexing with binary search trees; a better approach to tree indexes; B-Trees; working up from the bottom; Example for creating a B-Tree

UNIT-VI

Sorting Techniques; Insertion sort, selection sort, merge sort, heap sort, searching Techniques: linear search, binary search and hashing

Referential Books:

- E.Horowiz and S.Sahani, " Fundamentals of Data structures", Galgotia Book source Pvt. Ltd.2003
- R.S.Salaria, " Data Structures & Algorithms" , Khanna Book Pblishing Co. (P) Ltd..,2002
- . Y.Langsam et. Al., " Data Structures using C and C++" , PHI, 1999

Course Name: Operating System Concepts

Course Code: 0327003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction, What is an operating system, Simple Batch Systems, Multi-programmed Batch systems, Time- Sharing Systems, Personal – Computer Systems, Parallel systems, Distributed systems, Real- Time Systems**.**

Memory Management: Background, Logical versus physical Address space, swapping, Contiguous allocation, Paging, Segmentation

Virtual Memory: Demand Paging, Page Replacement, Page- replacement Algorithms, Performance of Demand Paging, Allocation of Frames, Thrashing, Other Considerations

UNIT-II

Processes: Process Concept, Process Scheduling, Operation on Processes

CPU Scheduling: Basic Concepts, Scheduling Criteria, Scheduling Algorithms, Multiple – Processor Scheduling.

Process Synchronization: Background, The Critical – Section Problem, Synchronization Hardware, Semaphores, Classical Problems of Synchronization

UNIT-III

Deadlocks: System Model, Deadlock Characterization, Methods for Handling Deadlocks, Deadlock prevention, Deadlock Avoidance, Deadlock Detection, Recovery from Deadlock

UNIT-IV

Device Management: Techniques for Device Management, Dedicated Devices, Shared Devices, Virtual Devices; Input or Output Devices, Storage Devices, Buffering, Secondary Storage Structure: Disk Structure, Disk Scheduling, Disk Management, Swap- Space Management, Disk Reliability

UNIT-V

Information Management: Introduction, A Simple File system, General Model of a File System, Symbolic File System, Basic File System, Access Control Verification, Logical File System, Physical File system File – System Interface; File Concept, Access Methods, Directory Structure, Protection, Consistency Semantics File – System Implementation: File – System Structure, Allocation Methods, Free- Space Management

Referential Books:

- Silbersachatz and Galvin, " Operating System Concepts", Person, 5th Ed. 2001
- Madnick E., Donovan J., " Operating Systems:,Tata McGraw Hill,2001
- Tannenbaum, "Operating Systems", PHI, 4th Edition, 2000

Course Name: Web Designing

Course Code: 0327004 Internal/External Marks: 25/75 Credit: 4

Unit- I

Introduction : Basic principles involved in developing a web site, Planning process , Domains and Hosting, Responsive Web Designing , Types of Websites (Static and Dynamic Websites), Web Standards and W3C recommendations, Introduction to HTML: What is HTML , HTML Documents, Basic structure of an HTML document , Creating an HTML document , Mark up Tags , Heading-Paragraphs , Line Breaks.

Unit- II

Elements of HTML: HTML Tags., Working with Text, Working with Lists, Tables and Frames, Working with Hyperlinks, Images and Multimedia, Working with Forms and controls

Unit- III

Concept of CSS: Creating Style Sheet, CSS Properties, CSS Styling (Background, Text Format, Controlling Fonts), Working with block elements and objects , Working with Lists and Tables , CSS Id and Class, Box Model(Introduction, Border properties, Padding Properties, Margin properties) CSS Advanced(Grouping, Dimension, Display, Positioning, Floating, Align, Pseudo class, Navigation Bar, Image Sprites, Attribute sector) , CSS Color , Creating page Layout and Site Designs.

Unit- IV

Introduction to Client Side Scripting , Introduction to Java Script , JavaScript Types , Variables in JS, Operators in JS Conditions Statements , Java Script Loops, JS Popup Boxes , JS Events , JS Arrays, Working with Arrays, JS Objects JS Functions , Using Java Script in Real time , Validation of Forms, Related Examples

Unit- V

Web Hosting: Web Hosting Basics, Types of Hosting Packages, Registering domains, Defining Name Servers, Using Control Panel, Creating Emails in Cpanel , Using FTP Client, Maintaining a Website

Concepts of SEO: Basics of SEO, Importance of SEO, On page Optimization Basics.

Referential Books:

- Steven M. Schafer, “HTML, XHTML, and CSS Bible, 5ed”, Wiley India
- Ian Pouncey, Richard York, “Beginning CSS: Cascading Style Sheets for Web Design”, Wiley India

Course Name: Numerical Methods

Course Code: 0327005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Roots of Equations: Bisections Method, False Position Method, Newton's Raphson Method, Rate of convergence of Newton's method.

UNIT-II

Interpolation and Extrapolation : Finite Differences, The operator E, Newton's Forward and Backward Differences, Newton's dividend differences formulae, Lagrange's Interpolation formula for unequal Intervals, Gauss's Interpolation formula, Starling formula, Bessel's formula, Laplace-Everett formula.

UNIT-III

Numerical Differentiation Numerical Integration : Introduction, direct methods, maxima and minima of a tabulated function, General Quadratic formula, Trapezoidal rule, Simpson's One third rule, Simpson's three- eight rule.

UNIT-IV

Solution of Linear Equation: Gauss's Elimination method and Gauss's Siedel iterative method.

UNIT-V

Solution of Differential Equations: Euler's method, Picard's method, Fourth-order Ranga – Kutta method.

Referential Books:

- Scarbourogh, "Numerical Analysis".
- Gupta & Bose S.C. "Introduction to Numerical Analysis, "Academic Press, Kolkata,
- S.S.Shashtri, " Numerical Analysis", PHI

SEMESTER -IV

Course Code	Course Name
0427001	Web Development Using PHP
0427002	Introduction to Python
0427003	Software Engineering
0427004	Introduction to DBMS
0427005	Optimization Techniques
0427080	PHP , PYTHON Prog. & DBMS Lab

Course Name: Web development using PHP.

Course Code: 0427001 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction to PHP, History of PHP, Versions of PHP, Features of PHP, Advantages of PHP over Other Scripting Languages, software requirements, Installation and Configuration of PHP, Installing and Configuring Apache to use PHP on Windows, Basic HTML, Embedding PHP in HTML, PHP Basic syntax, data types, comments, variables and constants, scope of variables, PHP arrays: creating array and accessing array elements, PHP String, PHP operators, precedence of operators, expressions, creating a PHP Script, running a PHP script.

UNIT-II

PHP conditional statements, switch case, PHP looping statements, while, for and do while loop, break, continue, exit, PHP functions: built-in and user defined function, declaration and calling of a function, function argument with call by value, call by reference, string manipulation, mathematical, date and time functions.

UNIT-III

Introduction to a web form, processing a web form, capturing form data, passing information between pages, PHP $_GET, PHP $_POST, with multi value fields, validating a web form, input validation, exception and error handling, introduction to cookies and session handling.

UNIT-IV

Working with database: PHP supported databases, using PHP & MySQL: Installation and configuration of MySQL on windows, checking configuration, connecting to database, selecting a database, adding table and altering table in a database, inserting, deleting and modifying data in a table, retrieving data, performing queries, processing result sets.

UNIT-V

Code re-use, require(), include(), and the include_path, PHP file permissions, working with files: opening, closing, reading, writing a file, file system functions and file input and output, working with directory: creating, deleting, changing a directory, file uploads, introduction to object oriented programming with PHP.

Referential Books:

- Steven Holzner, The Complete Reference PHP, TMH
- Steve Suehring, Tim Converse and Joyce Park, Wiley-India Pvt Ltd
- Matt Doyle, Beginning PHP, Wiley-India Pvt Ltd
- Joel Murach and Ray Harris, Murach's PHP & MySQL, SPD Pvt Ltd

Course Name: Introduction to Python

Course Code: 0427002 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Planning the computer program: concept of problem solving, problem definition, program design, debugging, types of errors in programming, documentation. Techniques of problem solving: flowcharting, decision table, algorithms, structured programming concepts, programming methodologies viz. Top-down and bottom-up programming. Overview of programming: structure of a python program, elements of pythonMemory

UNIT-II

Introduction to python: python interpreter, using python as calculator, python shell, indentation. Atoms, identifiers and keywords, literals, strings, operators (arithmetic operator, relational operator, logical or Boolean operator, assignment, operator, ternary operator, bit wise operator, increment or decrement operator) Creating python programs: input and output statements, control statements(branching, looping, conditional statement, exit function, difference between break, continue and pass.), defining functions, default arguments, errors and exceptions. Iteration and recursion: conditional execution, alternative execution, nested conditionals, the return statement.

UNIT-III

Recursion, stack diagrams for recursive functions, multiple assignment, the while statement, tables, two-dimensional tables Strings and lists: string as a compound data type, length, traversal and the for loop, string slices, string comparison, a find function.

UNIT-IV

Looping and counting, list values, accessing elements, list length, list membership, lists and for loops, list operations, list deletion. Cloning lists, nested lists Object oriented programming: introduction to classes, objects and methods, standard libraries.

UNIT-V

Data structures: arrays, list, set, stacks and queues. Searching and sorting: linear and binary search, bubble, selection and insertion sorting.

Referential Books:

- T. Budd, Exploring Python, TMH, 1st Ed, 2011
- How to think like a computer scientist: learning with Python / Allen Downey, Jeffrey Elkner, Chris Meyers.

Course Name: Software Engineering

Course Code: 0427003 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Software Engineering: Definition and paradigms, A generic view of software engineering.

UNIT-II

Requirements Analysis: Statement of system scope, isolation of top level processes and entitles and their allocation to physical elements, refinement and review.

Analyzing a problem, creating a software specification document, review for correctness, consistency, and completeness.

UNIT-III

Designing Software Solutions: Refining the software Specification; Application of fundamental design concept for data, architectural and procedural designs using software blue print methodology and object oriented design paradigm; Creating design document: Review of conformance to software requirements and quality.

UNIT-IV

Software Implementation: Relationship between design and implementation, Implementation issues and programming support environment, Coding the procedural design, Good coding style and review of correctness and readability.

UNIT-V

Software Maintenance: Maintenance as part of software evaluation, reasons for maintenance, types of maintenance (Perceptive, adoptive, corrective), designing for maintainability, techniques for maintenance.

UNIT-VI

Comprehensive examples using available software platforms/case tools, Configuration Management.

Referential Books:

- K.K.Aggarwal & Yogesh Singh "Software engineering", 2nd Ed., New Age International 2005.
- I.Sommerville, "Software Engineering", Addison Wesley, 2002.
- James Peter, W. Pedrycz, "Software Engineering: An Engineering Approach" John Wiley & Sons

Course Name: Introduction to DBMS

Course Code: 0427004 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Introduction: Characteristics of database approach, data models, DBMS architecture and data independence.

UNIT-II

E-R Modeling: Entity types, Entity set, attribute and key, relationships, relation types, roles and structural constraints, weak entities, enhanced E-R and object modeling, Sub classes; Super classes, inheritance, specialization and generalization.

UNIT-III

File Organization: Indexed sequential access files; implementation using B & B++ trees, hashing, hashing functions, collision resolution, extendible hashing, dynamic hashing approach implementation and performance.

UNIT-IV

Relational Data Model: Relational model concepts, relational constraints, relational alzebra

SQL: SQL queries, programming using SQL.

UNIT-V

EER and ER to relational mapping: Data base design using EER to relational language.

UNIT-VI

Data Normalization: Functional Dependencies, Normal form up to 3rd normal form.

Concurrency Control: Transaction processing, locking techniques and associated, database recovery, security and authorization. Recovery Techniques, Database Security

Referential Books:

- Abraham Silberschatz, Henry Korth, S.Sudarshan,"Database Systems Concepts", 4 th Edition, McGraw Hill, 1997.
- Jim Melton, Alan Simon, "Understanding the new SQL: A complete Guide", Morgan
- A.K.Majumdar, P. Bhattacharya, "Database Management Systems", TMH, 1996.
- Bipin Desai, "An Introduction to database systems", Galgotia Publications, 1991.

Course Name: Optimization Techniques

Course Code: 0427005 Internal/External Marks: 25/75 Credit: 4

UNIT-I

Linear programming

Central Problem of linear Programming various definitions included Statements of basic theorem and also their properties, simplex methods, primal and dual simplex method, transport problem, tic-tac problem, and its solution. Assignment problem and its solution. Graphical Method Formulation, Linear Programming Problem.

UNIT-II

Queuing Theory

Characteristics of queuing system, Classification of Queuing Model Single Channel Queuing Theory, Generalization of steady state M/M/1 queuing models(Model-I, Model-II).

UNIT-III

Replacement Theory

Replacement of item that deteriorates replacement of items that fail. Group replacement and individual replacement.

UNIT-IV

Inventory Theory

Cost involved in inventory problem- single item deterministic model economics long size model without shortage and with shorter having production rate infinite and finite.

UNIT-V

Job Sequencing

Introduction, solution of sequencing problem Johnson s algorithm for n jobs through 2 machines

Referential Books:

- Gillet B.E. “Introduction to Operation Research”
- Taha,H.A. “Operation Research - an introduction”
- Kanti Swarup “Operation Research”