ANNA ADARSH COLLEGE FOR WOMEN

DEPARTMENT OF BCA SHIFT-I

ACADEMIC YEAR -2020-21

Learning Outcomes

Preamble

Bachelor of Computer Applications (BCA) is a 3 – Year Under Graduate Programme Spread over six semesters. The Course is designed to bridge the gap between IT industries and Academic institutes by incorporating the latest development, into the Curriculum and to give students a complete understanding within a structured framework. The Course helps the students to build-up a successful Career in Computer Science and for pursuing higher studies in Computer Science.

I Year- NEW SYLLABUS

II Year & III Year- OLD SYLLABUS

NOTE: SAZ- OLD SYLLABUS BRANCH CODE

SZ1-REVISED SYLLABUS BRANCH CODE with effect from 2020-21

ODD SEMESTER

SEMESTER -I

Core I: Problem Solving using Python
SUBJECT CODE SE21A

COURSE OBJECTIVES:

- Describe the core syntax and semantics of Python programming language.
- Discover the need for working with the strings and functions.
- Illustrate the process of structuring the data using lists, dictionaries, tuples and sets.
- Understand the usage of packages and Dictionaries.

UNIT – I

Introduction: The essence of computational problem solving – Limits of computational problem solving-Computer algorithms-Computer Hardware-Computer Software-The process of computational problem solving-Python programming language - Literals - Variables and Identifiers - Operators - Expressions and Data types.

UNIT - II

Control Structures: Boolean Expressions - Selection Control - If Statement- Indentation in Python- Multi-Way Selection -- Iterative Control- While Statement- Infinite loops- Definite vs. Indefinite Loops- Boolean Flags and Indefinite Loops. Lists: List Structures - Lists in Python - Iterating over lists in Python.

UNIT - III

Functions: Program Routines- Defining Functions- More on Functions: Calling Value-Returning Functions- Calling Non-Value-Returning Functions- Parameter Passing - Keyword Arguments in Python - Default Arguments in Python-Variable Scope.

UNIT - V

Objects and their use: Software Objects - Turtle Graphics – Turtle attributes-Modular Design: Modules - Top- Down Design - Python Modules - Text Files: Opening, reading and writing text files - String Processing - Exception Handling.

UNIT - V

Dictionaries and Sets: Dictionary type in Python - Set Data type. Object Oriented Programming using Python: Encapsulation - Inheritance – Polymorphism. Recursion: Recursive Functions.

TEXT BOOK:

1. Charles Dierbach, “Introduction to Computer Science using Python - A computational Problem solving Focus”, Wiley India Edition, 2015.

REFERENCE BOOKS:

1. Mark Lutz, “*Learning Python Powerful Object Oriented Programming*”, O’reilly Media 2018, 5th Edition.
2. Timothy A. Budd, “*Exploring Python*”, Tata MCGraw Hill Education Private Limited 2011, 1st Edition.
3. Allen Downey, Jeffrey Elkner, Chris Meyers, “*How to think like a computer scientist: learning with Python*”, 2012.

4. Sheetal Taneja & Naveen kumar, "*Python Programming a Modular approach – A Modular approach with Graphics, Database, Mobile and Web applications*", Pearson, 2017.
5. Ch Satyanarayana M Radhika Mani, B N Jagadesh, "*Python programming*", Universities Press 2018.

WEB REFERENCES

http://interactivepython.org/courselib/static/pythonds
http://www.ibiblio.org/g2swap/byteofpython/read/
http://www.diveintopython3.net/
http://greenteapress.com/wp/think-python-2e/
NPTEL & MOOC courses titled Python programming
http://spoken-tutorial.org/tutorial-search/?search_foss=Python&search_language=English
http://docs.python.org/3/tutorial/index.html

COURSE OUTCOMES:

- To Understand the principles of Python and acquire skills in programming in python
- To develop the emerging applications of relevant field using Python
- Interpret the fundamental Python syntax and semantics and be fluent in the use of Python control flow statements.
- Able to develop simple turtle graphics programs in Python.

Practical I: Problem Solving using Python Lab
SUBJECT CODE:SE211

COURSE OBJECTIVES:

- To implement the python programming features in practical applications.
- To write, test, and debug simple Python programs.
- To implement Python programs with conditionals and loops.
- Use functions for structuring Python programs.
- Represent compound data using Python lists, tuples, dictionaries, turtles, Files and modules

LIST OF EXERCISES:

1. Program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon the user's choice.
2. Program to calculate total marks, percentage and grade of a student. Marks obtained in each of the five subjects are to be input by the user. Assign grades according to the following criteria:
   Grade A: Percentage >=80
   Grade B: Percentage >=70 and <80
   Grade C: Percentage >=60 and <70
   Grade D: Percentage >=40 and <60
   Grade E: Percentage <40
3. Program, to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from the user.
4. Program to display the first n terms of Fibonacci series.
5. Program to find factorial of the given number using a recursive function.
6. Write a Python program to count the number of even and odd numbers from an array of N numbers.
7. Python function that accepts a string and calculates the number of upper case letters and lower case letters.
8. Python program to reverse a given string and check whether the given string is palindrome or not.
9. Write a program to find the sum of all items in a dictionary.
10. Write a Python program to construct the following pattern, using a nested loop
    1
    22
    333
    4444
    55555
    666666
    7777777
    88888888
    999999999
11. Read a file content and copy only the contents at odd lines into a new file.
12. Create a Turtle graphics window with a specific size.
13. Write a Python program for Towers of Hanoi using recursion
14. Create a menu driven Python program with a dictionary for words and their meanings.
15. Devise a Python program to implement the Hangman Game.

COURSE OUTCOMES:

- ❖ Understand the numeric or real-life application problems and solve them.
- ❖ Apply a solution clearly and accurately in a program using Python.
- ❖ Apply the best features available in Python to solve the situational problems.

SEMESTER -III

Core Paper-V-Programming in C++ and Data Structures
SUBJECT CODE : SAZ3A

COURSE OBJECTIVES:

- To understand the concepts of ADTs.
- To learn linear data structures-lists, stacks, queues.
- To inculcate knowledge on Object-oriented programming concepts using C++.
- To apply the user defined classes in smaller applications and how to reuse the existing classes.

Unit 1:

Introduction to C++; Tokens, Keywords, Identifiers, Variables, Operators, Manipulators, Expressions and Control Structures in C++; Pointers - Functions in C++ - Main Function -Function Prototyping - Parameters Passing in Functions - Values Return by Functions - Inline Functions - Friend and Virtual Functions.

Unit-2:

Classes and Objects; Constructors and Destructors; and Operator Overloading and Type Conversions - Type of Constructors - Function overloading. Inheritance : Single Inheritance - Multilevel Inheritance - Multiple Inheritance - Hierarchical Inheritance - Hybrid Inheritance. Pointers, Virtual Functions and Polymorphism; Managing Console I/O operations.

Unit 3:

Working with Files: Classes for File Stream Operations - Opening and Closing a File - End-of-File Deduction - File Pointers - Updating a File - Error Handling during File Operations - Command-line Arguments. Data Structures: Definition of a Data structure - primitive and composite Data Types, Asymptotic notations, Arrays, Operations on Arrays, Order lists.

Unit-4:

Stacks - Applications of Stack - Infix to Postfix Conversion, Recursion, Maze Problems - Queues- Operations on Queues, Queue Applications, Circular Queue. Singly Linked List-Operations, Application - Representation of a Polynomial, Polynomial Addition; Doubly Linked List - Operations, Applications.

Unit-5:

Trees and Graphs: Binary Trees - Conversion of Forest to Binary Tree, Operations - Tree Traversals; Graph - Definition, Types of Graphs, Hashing Tables and Hashing Functions, Traversal - Shortest Path; Dijkstra's Algorithm.

Recommended Texts :

i) E. Balagurusamy,1995,Object Oriented Programming with C++, Tata McGraw-Hill Publishing Company Ltd.

ii).E.Horowitz and S.Shani,1999,Fundamentals of Data Structures in C++ , Galgotia Pub.

Reference Books:

1. Robert Lafore, Object Oriented Programming in Microsoft C++, Galgotia publication.

ii.) H.Schildt, C++,1998,The Complete Reference-1998-TMH Edition, 1998.
2. R. Kruse C.L. Tondo and B. Leung ,1997, Data Structures and Program design in C, PHI.
3. Cangsam,Auguenstein,Tenenbaum,Data Structures using C & C++,PHI
4. D.Samantha,2005, Classic Data Structures, PHI,New Delhi.

COURSE OUTCOMES:

- Identify and practice the object-oriented programming concepts and techniques using data structures
- Implement abstract data types for linear data structures.
- Understanding the difference between top-down approach and bottom-up approach.

Core Paper VI :MICROPROCESSORS AND ITS APPLICATIONS
SUBJECT CODE SAZ3B

COURSE OBJECTIVES:

- To understand the basic organization of computers and the working of each component and CPU.
- To bring the programming features of 8085 Microprocessor and know the features of latest microprocessors.
- To understand the principles of Interfacing I/O devices and Direct Memory accesses.

Unit 1:

Introduction to microcomputers-microprocessor and assembly languages- microprocessor architecture and its operations-8085 MPU-8085 instruction set and classifications

Unit 2:

Writing assembly level programs-programming techniques such as looping-counting and indexing addressing modes-data transfer instructions-arithmetic and logic operations-dynamic debugging

Unit 3:

Counters and time delays-hexadecimal counter modulo 10 counter-pulse timings for flashing lights-debugging counter and time delay program-stack-subroutine-conditional call and return instructions

Unit 4:

BCD to binary and binary to BCD conversions-BCD to HEX and HEX to BCD conversions-ASCII to BCD to ASCII conversions-BCD to seven segment LED code conversions-binary to ASCII and ASCII to binary conversions-multi byte addition-multi byte subtraction-BCD addition-BCD subtraction-multiplication and division

Unit5:

Interrupt-implementing interrupts-multiple interrupt 8085-trap-problems on implementing 8085 interrupt-DMA memory interfaces-RAM & ROM –I/O interface-direct I/O memory mapped I/O.

Recommended Texts:

1. R.S.Ganokar-1990-Microprocessor architecture-Programming and Application with 8085/ 8080A-Wiley Eastern Limited.
2. A.Mathur-1993-Introduction to Microprocessor-3rd Edition-Tata McGraw Hill.

COURSE OUTCOMES:

- ❖ Developing the assembly language programming skills.
- ❖ Understanding of real time applications of Microprocessor as well as microcontroller.
- ❖ understanding the pin configuration and storage of data.

Core paper VIII :Practical – III : PROGRAMMING IN C++ USING DATA STRUCTURES.
SUBJECT CODE:SAZ31

COURSE OBJECTIVES:

- To understand the concepts of ADTs.
- To learn linear data structures-lists, stacks, queues.
- To know more about traversal algorithms of trees and graphs representation.

1. Implement PUSH, POP operations of stack using Arrays.
2. Implement PUSH, POP operations of stack using Pointers.
3. Implement add, delete operations of a queue using Arrays.
4. Implement add, delete operations of a queue using Pointers.
5. Conversion of infix to postfix using stack operations
6. Postfix Expression Evaluation.
7. Addition of two polynomials using Arrays and Pointers.
8. Creation, insertion, and deletion in doubly linked list.
9. Binary tree traversals (in-order, pre-order, and post-order) using linked list.
10. Depth First Search and Breadth first Search for Graphs using Recursion.

COURSE OUTCOMES:

- Design and implementation of OOPS concepts.
- Demonstrate the ability to understand and use Exception handling and file handling mechanisms.
- Critically analyze the various sorting algorithms.

SEMESTER -V

Core Paper XIII :DATABASE MANAGEMENT SYSTEMS
SUBJECT CODE : SAZ5A

COURSE OBJECTIVES:

- To know more about data, databases and information systems.
- To know about forms and reports.
- To know more about triggers.

Unit-1:

Advantages and Components of a Database Management Systems – Feasibility Study – Class Diagrams – Data Types – Events – Normal Forms – Integrity – Converting Class Diagrams to Normalized Tables – Data Dictionary.

Unit-2:

Query Basics – Computation Using Queries – Subtotals and GROUP BY Command – Queries with Multiple Tables – Subqueries – Joins – DDL & DML – Testing Queries

Unit-3:

Effective Design of Forms and Reports – Form Layout – Creating Forms – Graphical Objects – Reports – Procedural Languages – Data on Forms – Programs to Retrieve and Save Data – Error Handling.

Unit-4:

Power of Application Structure – User Interface Features – Transaction – Forms Events – Custom Reports – Distributing Application – Table Operations – Data Storage Methods – Storing Data Columns – Data Clustering and Partitioning.

Unit-5 :

Database Administration – Development Stages – Application Types – Backup and Recovery – Security and Privacy – Distributed Databases – Client/Server Databases – Web as a Client/Server System – Objects – Object Oriented Databases – Integrated Applications.

1. **Recommended Texts:**

i). G. V. Post – Database Management Systems Designing and Building Business Application – McGraw Hill International edition – 1999.

2. **Reference Books:**

i). Raghu Ramakrishnan – Database Management Systems – WCB/McGraw Hill – 1998.

ii) C.J. Date – An Introduction to Database Systems – 7th Edition – Addison Wesley - 2000

COURSE OUTCOMES:

- Analyze an information storage problem and derive an information model expressed in the form of an entity relation diagram and other optional analysis forms such as data dictionaries.
- Learning various methods of storing data.
- Learning the roles and responsibilities of Database Administrator.

Core Paper- XIV :SOFTWARE ENGINEERING
SUBJECT CODE : SAZ5B

COURSE OBJECTIVES:

- To introduce the software development life cycles.
- To understand the user requirement, system requirement and software requirement specifications.
- To provide an insight about software testing techniques.

Unit-1:

Introduction to Software Engineering Some definition – Some size factors – Quality and productivity factors – Managerial issue. Planning a Software Project: Defining the problem – Developing a solution strategy – planning the development process – planning an organization structure – other planning activities

Unit-2:

Software Cost Estimation: Software – Cost factors – Software cost estimation techniques – specification techniques – level estimation – estimating software maintenance costs.

Unit-3:

Software requirements definition: The software requirements specification – formal languages and processors for requirements specification.

Unit-4:

Software Design: Fundamental Design concepts – Modules and modularization Criteria – Design Notations – Design Techniques – Detailed Design Consideration – Real time and distributed system design – Test plan – Milestones walk through and inspection – Design guidelines

Unit-5:

Verification and validation techniques: Quality assurance – Static analysis – symbolic exception – Unit testing and Debugging – System testing – Formal verification. Software maintenance: Enhancing maintainability during development – Managua aspects of software maintenance – Configuration management – source code metrics – other maintenance tools and techniques.

Recommended Texts:

i) Richard E.Fairly - Software Engineering Concepts - Tata McGraw-Hill book Company.

Reference Books:

R.S.Pressman, 1997, Software Engineering – 1997 - Fourth Ed., McGraw Hill.
RajibMall ,2004,Fundamentals of Software Engineering,2nd Edition, PHI.

COURSE OUTCOMES:

- ❖ Implement different software development process models.
- ❖ Apply standard coding practices.
- ❖ Knowing the difference between verification and validation techniques.

Core Paper - XV :RESOURCE MANAGEMENT TECHNIQUES
SUBJECT CODE : SAZ5C

COURSE OBJECTIVES:

- Helps to make decisions.
- Helps to allocate minimum resources efficiently.
- Help to find the optimum solution for a given problem.

Unit-1:

Basics of Operations Research (OR): Characteristics of O.R - Necessity of O.R in Industry -OR and Decision making - Role of computers in O.R. Linear programming: Formulations and Graphical solution (of 2 variables) canonical & standard terms of Linear programming problem. Algebraic solution: Simplex method.

Unit-2:

Algebraic solution: Charnes method of penalties - two phase simplex method - concept of Duality - properties of duality - Dual simplex method.

Unit-3:

Transportation model: Definition - formulation and solution of transportation models the row - minima, column - minima, matrix minima and vogel's approximation methods. Assignment model: Definition of Assignment model - comparison with transportation model formulation and solution of Assignment model - variations of Assignment problem.

Unit-4:

Sequencing problem: Processing each of n jobs through m machines - processing n jobs through 2 machines - processing n jobs through 3 machines - processing 2 jobs through m machines - processing n jobs through m machines - travelling salesman problem. Game Theory: Characteristics of games -Maximin, Minimax criteria of optimality - Dominance property - algebraic and graphical method of solution of solving 2 x 2 games.

Unit-5:

Pert - CPM: Networks - Fulkerson's Rule - measure of activity - PERT computation - CPM computation - resource scheduling. Simulation: Various methods of obtaining random numbers for use in computer simulation - Additive, multiplicative and mixed types of congruence random number generators - Monte Carlo method of simulation - its advantages and disadvantages.

Recommended Texts:

Hamdy A. Taha: ,1996,Operation Research - An Introduction, 5th edition, Prentice Hall of India, Pvt. Ltd., New Delhi .

ii.) Ackoff R.L. and Sasieni M. W,1968, Fundamentals of Operations Research, John Wiley and sons, New York.

Charnes A. Cooper W. and Hendersen A.,1953, Introduction to Linear Programming, Wiley and Sons, New York.

Srinath L.S,1973, PERT and CPM principles and applications, Affiliated East West Press Pvt. Ltd., New York .

COURSE OUTCOMES:

- ❖ Able to know the formulation of linear programming problems.
- ❖ Able to allocate jobs to machines efficiently.
- ❖ Able to reduce the transportation cost.

Core Paper - XVI :PRACTICAL – V : RDBMS LAB
SUBJECT CODE : SAZ51

COURSE OBJECTIVES:

- To learn about the connectivity between the front-end application with back end.
- Learn to create simple applications.
- Learn to create reports.

Creation of a Database and performing the operations given below using a Menu Driven Program.
a) Insertion b)Deletion c) Modification d) Generating a Simple report for the following:

1. Payroll
2. Mark sheet Processing
3. Saving Bank account for banking
4. Inventory System
5. Invoice system
6. Library information system
7. Student information system
8. Income tax processing system
9. Electricity bill preparation system
10. Telephone directory maintenance

COURSE OUTCOMES:

- ❖ Brief knowledge about SQL Fundamentals.
- ❖ Creation of databases, tables and their respective fields.
- ❖ Learn to store and retrieve data from backend through front end.

Elective - I :VISUAL PROGRAMMING
SUBJECT CODE : SEZ5A

COURSE OBJECTIVES:

- To learn about various toolbars, menus, buttons to create front end applications.
- To learn about various tools and its properties.
- To learn about various connectivity controls.

Unit 1:
Customizing a Form - Writing Simple Programs - Toolbox - Creating Controls - Name Property - Command Button - Access Keys - Image Controls - Text Boxes - Labels - Message Boxes - Grid - Editing Tools - Variables - Data Types - String - Numbers.
Unit-2:
Displaying Information - Determinate Loops - Indeterminate Loops - Conditionals - Built-in Functions - Functions and Procedures.
Unit 3:
Lists - Arrays - Sorting and Searching - Records - Control Arrays - Combo Boxes - Grid Control - Projects with Multiple forms - DoEvents and Sub Main - Error Trapping.
Unit-4
:VB Objects - Dialog Boxes - Common Controls - Menus - MDI Forms - Testing, Debugging and Optimization - Working with Graphics.
Unit-5 :
Monitoring Mouse activity - File Handling - File System Controls - File System Objects - COM/OLE - automation - DLL Servers - OLE Drag and Drop.

1. **Recommended Texts :**
    1. Gary Cornell - Visual Basic 6 from the Ground up - Tata McGraw Hill - 1999.
    2. Noel Jerke - Visual Basic 6 (The Complete Reference) - Tata McGraw Hill – 1999.

COURSE OUTCOMES:

- ❖ Explore Visual Basic's IDE.
- ❖ Apply procedures, sub-procedures and functions to create manageable code.
- ❖ To create various reports.

EVEN SEMESTER

SEMESTER -II

CORE - II OBJECT ORIENTED PROGRAMMING CONCEPTS USING C++

SUBJECT CODE: SU22A

COURSE OBJECTIVES

- To inculcate knowledge on Object-oriented programming concepts using C++.
- To gain Knowledge on programming with C++.
- To apply the user defined classes in smaller applications.And how to reuse the existing classes.

UNIT - I

Introduction to C++ - key concepts of Object-Oriented Programming –Advantages – Object Oriented Languages – I/O in C++ - C++ Declarations. Control Structures : - Decision Making and Statements : If ..else, jump, goto, break, continue, Switch case statements - Loops in C++ : for, while, do - functions in C++ - inline functions – Function Overloading.

UNIT - II

Classes and Objects: Declaring Objects – Defining Member Functions – Static Member variables and functions – array of objects –friend functions – Overloading member functions – Bit fields and classes – Constructor and destructor with static members.

UNIT- III

Operator Overloading: Overloading unary, binary operators – Overloading Friend functions – type conversion – Inheritance: Types of Inheritance – Single, Multilevel, Multiple, Hierarchal, Hybrid, Multi path inheritance – Virtual base Classes – Abstract Classes.

UNIT - IV

Pointers – Declaration – Pointer to Class , Object – this pointer – Pointers to derived classes and Base classes – Arrays – Characteristics – array of classes – Memory models – new and delete operators – dynamic object – Binding, Polymorphism and Virtual Functions.

UNIT - V

Files – File stream classes – file modes – Sequential Read / Write operations – Binary and ASCII Files – Random Access Operation – Templates – Exception Handling - String – Declaring and Initializing string objects – String Attributes – Miscellaneous functions .

TEXT BOOK:

E. Balagurusamy, “Object-Oriented Programming with C++”, TMH 2013, 7th Edition.

REFERENCE BOOKS:

Ashok N Kamthane, “Object-Oriented Programming with ANSI and Turbo C++”, Pearson Education 2003.

Maria Litvin & Gray Litvin, “C++ for you”, Vikas publication 2002.

WEB REFERENCES:

NPTEL & MOOC courses titled Object oriented programming concepts using C++
https://alison.com/course/introduction-to-c-plus-plus-programming.

COURSE OUTCOMES:

- To write programs using OOP concepts like Abstraction, Encapsulation, Inheritance and Polymorphism
- Understanding the difference between top-down approach and bottom-up approach.
- Apply virtual and pure virtual functions in complex programming situations.

PRACTICAL II C++ PROGRAMMING LAB
SUBJECT CODE : SU221

COURSE OBJECTIVE

- To implement the various object-oriented programming concepts using C++.
- To implement the inheritance concepts using C++.
- To implement the abstraction concepts using C++.
- To implement the encapsulation concepts using C++.

LIST OF EXERCISES:

1. Write a C++ program to demonstrate function overloading, Default Arguments and Inline function.
2. Write a C++ program to demonstrate Class and Objects
3. Write a C++ program to demonstrate the concept of Passing Objects to Functions
4. Write a C++ program to demonstrate the Friend Functions.
5. Write a C++ program to demonstrate the concept of Passing Objects to Functions
6. Write a C++ program to demonstrate Constructor and Destructor
7. Write a C++ program to demonstrate Unary Operator Overloading
8. Write a C++ program to demonstrate Binary Operator Overloading
9. Write a C++ program to demonstrate:
    a. Single Inheritance
    b. Multilevel Inheritance
    c. Multiple Inheritance
    d. Hierarchical Inheritance
    e. Hybrid Inheritance
10. Write a C++ program to demonstrate Virtual Functions.
11. Write a C++ program to manipulate a Text File.
12. Write a C++ program to perform Sequential I/O Operations on a file.
13. Write a C++ program to find the Biggest Number using Command Line Arguments
14. Write a C++ program to demonstrate Class Template
15. Write a C++ program to demonstrate Function Template.
16. Write a C++ program to demonstrate Exception Handling.

COURSE OUTCOME

- ❖ To understand the structure and model of the C++ programming language.
- ❖ To solve problems in C++ demonstrating Object Oriented Concepts
- ❖ To illustrate the process of data file manipulations using C++.

SEMESTER -IV

Core Paper - IX :PROGRAMMING IN JAVA
SUBJECT CODE : SAZ4A

COURSE OBJECTIVES:

- To learn about the control structures, class with attributes and methods used in Java
- To know the difference between method overloading and overriding.
- To learn about the interfaces and packages.

Unit-1:

Introduction to Java-Features of Java-Basic Concepts of Object Oriented Programming-Java Tokens-Java Statements-Constants-Variables-Data Types- Type Casting-Operators-Expressions-Control Statements: Branching and Looping Statements.

Unit-2:

Classes, Objects and Methods - Constructors - Methods Overloading-Inheritance- Overriding Methods-Finalizer and Abstract Methods-Visibility Control –Arrays, Strings and Vectors-StringBuffer Class-Wrapper Classes

Unit-3:

Interfaces-Packages-Creating Packages-Accessing a Package-Multithreaded Programming-Creating Threads-Stopping and Blocking a Thread-Life Cycle of a Thread-Using Thread Methods-Thread Priority-Synchronization-Implementing the Runnable Interface

Unit-4:

Managing Errors and Exceptions-Syntax of Exception Handling Code-Using Finally Statement-Throwing Our Own Exceptions-Applet Programming-Applet Life Cycle-Graphics Programming-Managing Input/Output Files: Concept of Streams-Stream Classes-Byte Stream Classes-Character Stream Classes – Using Streams-Using the File Class-Creation of Files-Random Access Files-Other Stream Classes.

Unit-5 :

Network basics –socket programming – proxy servers – TCP/IP – Net Address – URL – Datagrams -Java Utility Classes-Introducing the AWT: Working with Windows, Graphics and Text- AWT Classes- Working with Frames-Working with Graphics-Working with Color-Working with Fonts-Using AWT Controls, Layout Managers and Menus.

Recommended Texts

E. Balagurusamy ,2004,Programming with JAVA-2nd Edition, Tata McGraw-Hill Publishing Co.Ltd, New Delhi.

Herbert Schildt,The Complete Reference JavaTM , 2- 5thEdition,Tata McGraw-Hill Publishing Co. Ltd,New Delhi.

Reference Books:

Y. Daniel Liang ,2003, An Introduction to JAVA Programming ,Prentice-Hall of India Pvt. Ltd.
Cay S. Horstmann and Gary Cornell,2005,Core JavaTM2 Volume I,Fundamental 7thEdition,Pearson Education.

COURSE OUTCOMES

- Ability to make use of members of classes found in JAVA API.
- Understand the concept of multithreading and File handling in java.
- Understand the basic principles of creating Java applications with GUI.

Core Paper - X :OPERATING SYSTEMS
SUBJECT CODE : SAZ4B

COURSE OBJECTIVES

- To learn Process management and scheduling.
- To understand the concepts and implementation of memory management policies.
- To understand the various issues in Inter Process Communication.

Unit 1:

Introduction: Views –Goals –Types of system – OS Structure –Components – Services - System Structures – Layered Approach -Virtual Machines - System Design and Implementation. Process Management: Process - Process Scheduling – Cooperating Process – Threads - Interprocess Communication. CPU Scheduling : CPU Schedulers – Scheduling criteria – Scheduling Algorithms

Unit-2:

– Process Synchronization: Critical-Section problem - Synchronization Hardware – Semaphores – Classic Problems of Synchronization – Critical Region – Monitors. Deadlock : Characterization – Methods for handling Deadlocks – Prevention, Avoidance, and Detection of Deadlock - Recovery from deadlock.

Unit 3:

Memory Management : Address Binding – Dynamic Loading and Linking – Overlays – Logical and Physical Address Space - Contiguous Allocation – Internal & External Fragmentation . Non Contiguous Allocation: Paging and Segmentation schemes – Implementation – Hardware Protection – Sharing - Fragmentation.

Unit-4:

VirtualMemory :: Demand Paging – Page Replacement - Page Replacement Algorithms – Thrashing. – File System: Concepts – Access methods – Directory Structure – Protection Consistency Semantics – File System Structures – Allocation methods – Free Space Management.

Unit-5 :

I/O Systems: Overview - I/O Hardware – Application I/O Interface – Kernel I/O subsystem – Transforming I/O Requests to Hardware Operations – Performance. Secondary Storage Structures : Protection – Goals- Domain Access matrix – The security problem – Authentication – Threats – Threat Monitoring – Encryption..

Recommended Texts:

i) Silberschatz A., Galvin P.B., Gange,.2002 , Operating System Principles ,Sixth Edition, John Wiley & Sons.

Reference Books:

i) H.M. Deitel ,1990, An Introduction to Operating System,- Second Edition, Addison Wesley.

COURSE OUTCOME

- ❖ Understand the types of IO management, disk scheduling, protections and security problems faced by operating systems and how to minimize these problems.
- ❖ Learning algorithm to detect the deadlock.
- ❖ Learning various job scheduling algorithms.

Core Paper - XI :COMPUTER GRAPHICS
SUBJECT CODE: SAZ5C

COURSE OBJECTIVES:

- To know more about two-dimensional and three-dimensional objects.
- Learning the basic transformation as well as other transformations.
- Learning the hidden surface and visible surface of an object.

Unit-1:

Brief Survey of Computer Graphics – Graphics Systems: Video Display Devices – Types – Raster-Scan Systems and Random-Scan Systems – Input Devices – Hard-Copy Devices – Graphics Software.

Unit-2:

Line-Drawing (DDA and Bresenham's) Algorithms – Circle-Generating (Midpoint) Algorithm – Ellipse-Generating (Midpoint) Algorithms – Area-Filling (Boundary-Fill and Flood-Fill) Algorithms - Line Attributes - Color and Grayscale Levels – Character Attributes – Inquiry Functions .

Unit-3:

Two-Dimensional Transformations and Viewing: Basic Transformations – Matrix Representations and Homogeneous Coordinates – Composite Transformations–Other Transformations Window-to- Viewport Coordinate Transformation – Clipping Algorithms: Cohen-Sutherland Line Clipping and Sutherland – Hodgeman Polygon Clipping – Basic Modeling Concepts – Interactive Input Methods: Logical Classification of input Devices – Interactive Picture-Construction Techniques.

Unit-4:

Three-Dimensional Display Methods: Parallel and Perspective Projections – Depth Cueing - Visible Line and Surface Identification – Polygon Surfaces: Polygon Tables, Plane Equations and Polygon Meshes - Three-Dimensional Transformations: Basic, Other and Composite Transformations.

Unit-5 :

Viewing Pipeline and Coordinates – Transformation from World to Viewing Coordinates – Projection Transformations - Matrices - View Volumes - Hidden Surface and Hidden Line Elimination Methods: Back-Face Detection , Depth-Buffer and A-Buffer Methods – -Wireframe Methods.

Recommended Texts:

i) D.Hearn and M.P. Baker, 2005, Computer Graphics , C Version,2nd Edition , Pearson Education , New Delhi.

Reference Books:

i) W.M.Newman and R.F.Sproull,1997,2nd Edition ,Principles of Interactive Computer Graphics, Tata McGraw-Hill Publishing Co. Ltd. ii).D.P.Mukherjee,1999,Fundamentals of Computer Graphics and Multimedia, 1st Edition, Prentice-Hall of India Pvt. Ltd. – 1999.

iii).N. Krishnamurthy ,2002,Introduction to Computer Graphics, 1st Edition, Tata McGraw-Hill Publishing Co. Ltd..

D.F.Rogers , 2001, Procedural Elements for Computer Graphics , 2nd Edition , Tata McGraw-Hill Publishing Co. Ltd..

Xiang and R.A. Plastock ,2002 ,Computer Graphics , Schaum's Outline Series, Tata McGraw-Hill Publishing Co.

COURSE OUTCOMES

- Demonstrate graphical transformations, Objects hierarchy in graphics application.
- Learning various line drawing algorithms.
- Learning about various Graphical display devices and its corresponding hardware units.

Core Paper – XII: Practical – IV : JAVA PROGRAMMING LAB
SUBJECT CODE : SAZ41

COURSE OBJECTIVES

- To learn about the control structures, class with attributes and methods used in Java
- To know the difference between method overloading and overriding.
- To learn about the interfaces and packages.

APPLICATIONS:

1. Substring Removal from a String. Use String Buffer Class.
2. Determining the Perimeter and Area of a Triangle. Use Stream Class.
3. Determining the Order of Numbers Generated randomly using Random Class.
4. Usage of Calendar Class and Manipulation.
5. Implementation of Point Class for Image Manipulation.
6. String Manipulation Using Char Array.
7. Database Creation for Storing E-mail Addresses and Manipulation.
8. Usage of Vector Classes.
9. Interfaces and Packages
10. Implementing Thread based Applications and Exception Handling.
11. Application using Synchronization such as Thread based, Class based and Synchronized Statements.
12. Textfiles (copy, display, counting characters, words and lines)
13. Data file creating and processing for electricity billing.
14. Data file creating and processing for telephone billing

APPLETS:

1. Working with Frames and Various Controls.
2. Working with Dialog Box and Menus.
3. Working with Colors and Fonts.
4. Drawing various shapes using Graphical statements.
5. Working with panel and all types of Layout.
6. Design a simple calculator with minimal of 10 operations
7. Usage of buttons, labels, text components in suitable application
8. Usage of Radio buttons, check box ,choice list in suitable application

COURSE OUTCOMES

- ❖ Discuss the principles of inheritance, importance of multithreading
- ❖ Implement different exception handling mechanisms.
- ❖ Understand java GUI applications based on MVC architecture.

SEMESTER -VI

Core Paper- XVII :WEB TECHNOLOGY
SUBJECT CODE : SAZ6A

COURSE OBJECTIVES

- To understand Web based programming and scripting languages.
- To learn the basic web concepts and to create rich internet applications that use the most recent client-side programming technologies.
- To learn the basics of HTML, XML, CSS, Java Script .

Unit 1:

Introduction to VBScript - Adding VBScript Code to an HTML Page - VB Script Basics - VBScript Data Types - VBScript Variables - VBScript Constants - VBScript Operators – mathematical- comparison-logical - Using Conditional Statements - Looping Through Code - VBScript Procedures – type casting variables - math functions –date functions – string functions –other functions - VBScript Coding Conventions - Dictionary Object in VBScript - Err Object

Unit-2:

Introduction to Javascript – Advantages of Javascript – Javascript syntax - Data type –Variable - Array – Operator & Expression – Looping – control structures - Constructor Function – user defined function Dialog Box .

Unit 3

:Javascript document object model – Introduction – Object in HTML – Event Handling – Window object – Document object – Browser object – Form object – Navigator object – Screen object – Build in object – User defined object – Cookies.

Unit-4:

ASP.NET Language Structure – Page Structure – Page event , Properties & Compiler Directives . HTML server controls – Anchor, Tables, Forms, Files . Basic Web server Controls – Label, Text box, Button, Image Links, Check & radio Button, Hyperlink, Data List Web Server Controls – Check box list. Radio button list, Drop down list, List box, Data grid, Repeater.

Unit-5:

Request and Response Objects, Cookies, Working with Data – OLEDB connection class, command class, transaction class, data adaptor class, data set class. Advanced issues – email, Application issues, working with IIS and page Directives , error handling.
Security – Authentication, IP Address, Secure by SSL & Client Certificates

Recommended Texts :

i.)I.Bayross, 2000, Web Enabled Commercial Application Development Using HTML, DHTML, Javascript, Perl CGI, BPB Publications.
ii.) A.Russell Jones, Mastering Active Server Pages 3, BPB Publications.

Reference Books:

i.) HathleenKalata, Internet Programming with VBScript and JavaScript, Thomson Learning
ii.) Mike McGrath, XML Harness the Power of XML in easy steps, Dreamtech Publications
T.A. Powell, 2002,Complete Reference HTML , TMH.
J.Jaworski, 1999, Mastering Javascript, BPB Publications.
Powell, Thomas; Schneider, Fritz, JavaScript: The Complete Reference, 2nd edition2004, TMH

COURSE OUTCOMES

- Create XML documents and XML Schema.
- Ability to Develop and publish Web pages using Hypertext Markup Language (HTML).
- Ability to optimize page styles and layout with Cascading Style Sheets (CSS).

Core Paper - XVIII : DATA COMMUNICATION AND NETWORKING
SUBJECT CODE : SAZ6B

COURSE OBJECTIVES

- To learn the components of communication devices.
- To various network topologies.
- To learn about various types of networks available for communications.

Unit-1:
Introduction to Data Communication, Network, Protocols & standards and standards organizations - Line Configuration - Topology - Transmission mode - Classification of Network - OSI Model - Layers of OSI Model.

Unit-2:
Parallel and Serial Transmission - DTE/DCE/such as EIA-449, EIA-530, EIA-202 and x.21 interface - Interface standards - Modems - Guided Media - Unguided Media - Performance - Types of Error - Error Detection - Error Corrections.

Unit-3:
Multiplexing - Types of Multiplexing - Multiplexing Application - Telephone system - Project 802 - Ethernet - Token Bus - Token Ring - FDDI - IEEE 802.6 - SMDS - Circuit Switching - Packet Switching - Message switching - Connection Oriented and Connectionless services.

Unit-4:
History of Analog and Digital Network - Access to ISDN - ISDN Layers - Broadband ISDN - X.25 Layers - Packet Layer Protocol - ATM - ATM Topology - ATM Protocol.

Unit-5:
Repeaters - Bridges - Routers - Gateway - Routing algorithms - TCP/IP Network, Transport and Application Layers of TCP/IP - World Wide Web

Recommended Texts :
i) .Behrouz and Forouzan,2001,Introduction to Data Communication and Networking, 2ndEdition,TMH.

Reference Books:
i.) Jean Walrand 1998,Communication Networks (A first Course),Second Edition, WCB/McGraw Hill.
ii). Behrouz and Forouzan,2006,Data Communication and Networking,3nd Edition, TMH.

COURSE OUTCOMES:

- ❖ Define, use and implement Computer Networks and the basic component of a Network system.
- ❖ Gain in depth knowledge about the layers of communication.
- ❖ Gain in depth knowledge about various hardware components involved in the communications.

Core Paper – XIX :SOFTWARE TESTING
SUBJECT CODE : SAZ6C

COURSE OBJECTIVES

- To learn about the difference between test case and test plan.
- To learn about six phases of testing.
- To understand where to apply what type of testing based on user needs.

Unit-1:

Introduction: Purpose – Productivity and Quality in Software – Testing Vs Debugging – Model for Testing – Bugs – Types of Bugs – Testing and Design Style.

Unit-2:

Flow/Graphs and Path Testing – Achievable paths – Path instrumentation – Application – Transaction Flow Testing Techniques

Unit-3:

Data Flow Testing Strategies - Domain Testing: Domains and Paths – Domains and Interface Testing .

Unit-4:

Linguistic –Metrics – Structural Metric – Path Products and Path Expressions. Syntax Testing – Formats – Test Cases .

Unit-5:

Logic Based Testing – Decision Tables – Transition Testing – States, State Graph, State Testing.

Recommended Texts

B. Beizer , 2003, Software Testing Techniques, II Edn., DreamTech India, New Delhi.
K.V.KK. Prasad , 2005, Software Testing Tools, DreamTech. India, New Delhi.

Reference Books

Burnstein, 2003, Practical Software Testing, Springer International Edn.
E. Kit, 1995, Software Testing in the Real World: Improving the Process, Pearson Education, Delhi.
R.Rajani, and P.P.Oak, 2004, Software Testing, Tata Mcgraw Hill, New Delhi..

COURSE OUTCOMES

- ❖ Various test processes and the use of various test tools.
- ❖ Application of software testing techniques in commercial Environments.
- ❖ To learn about flow of data.

Core Paper -XX :Practical – VI : WEB APPLICATIONS LAB
SUBJECT CODE : SAZ61

COURSE OBJECTIVES

- Able to learn tools like banners, hit counter and mouse over images etc.
- To learn the retrieval of data from a back-end database and display it on the webpage.
- To navigate through the web pages.

1. Write a program outputs the squares, roots, cubes and complements of integers between 1 and 100.
2. Create a calculator.
3. Write a script to Sort numbers and strings
4. Create a program to generate a hit counter
5. Create a program to verify whether email address provided by user is valid or invalid.
6. Write a program to scroll the text on status bar.
7. The form consists of two multiple choice list and one single choice list
8. the first multiple choice list display the major dishes available.
9. the second Multiple choice list display the stocks available.
10. The single choice list display the miscellaneous (Milkshakes, soft drinks, softy available etc.)
11. Write a sript to create a digital clock.
12. Create a web page using two image file which switch black and white one another as the mouse pointer moves over the image. Use the On Mouse over and On Mouse event, onDblclick handler
13. Build a WWW page with an image and 3 buttons., Pick three favorite graphics, Label the buttons and make each one swap in the graphic you have chosen
14. Create a frameset that has two frames, side by side. Make the left-hand frame contain a form with 3 radio buttons
    The buttons should be for three search engines:
    Yahoo (http://www.yahoo.com)
    Altavista (http://www.altavista.com)
    Infoseek (http://www.infoseek.com)
    When the user clicks on of the option buttons, the frame on the right hand side should be loaded with the right search engine.

15..Write a program to implement Employee database with all validation

ASP

1. Create a login form, to expire, if the user does not type the password within 100 seconds Create an employee database and manipulate the records using command object in ASP
2. Develop an application to illustrate the usage of Request and Response Objects in ASP.
3. Write an ASP program using Request Object to give the exact list of headers sent by the browser to the Web server.
4. Create an Active Server Page to display the records one by one from a student database. The student database should contain roll no, name, marks & total.
5. Design an ASP application that describes books in the Online Bookshop.(Use AD

Rotator Component, Content Rotator Component, Content Linking Component)

6. Create a document and add a link to it. When the user moves the mouse over the link it should load the linked document on its own (User is not required to click on the link).
7. Create a document, which opens a new window without a toolbar, address bar, or a status bar that unloads itself after one minute.
8. Create a document that accepts the user's name in a text field form and displays the same
9. the next time when the user visits the site informing him that he has accessed the site for the second time, and so on.

COURSE OUTCOMES

- Able to create web pages.
- Analyze a web page and identify its elements and attributes.
- Build and consume web services.

Elective -I- E-COMMERCE
SUBJECT CODE :SEZ6B

COURSE OBJECTIVES

- To provide students with an overview and understanding of e-commerce with a specific emphasis on Internet Marketing.
- To explore the major issues associated with e-commerce-security, privacy, intellectual property rights.
- To understand more about authentication, encryption, acceptable use policies, and legal liabilities.

Unit-1:

Electronic Commerce and Opportunities : Background
The Electronic Commerce Environment – Electronic Marketplace Technologies – Modes of Electronic Commerce: Overview : Electronic Data Interchange.

Unit-2:

Approaches to Safe Electronic Commerce . Overview – Secure Transport Protocols – Secure Transaction – Secure Electronic Payment Protocol (SEPP) – Secure Electronic Transaction (SET)

Unit-3:

Certificates for Authentication – Security on Web Servers – Payment Schemes: Internet Monetary Payment and Security Requirements- Payment and purchase order process – Online electronic cash.

Unit-4:

Internet / Intranet Security Issues and Solutions : The Need for Computer Security – Specific Intruder Approaches – Security Strategies-
Security Tools – Encryption – Enterprise Networking and Access to the
Internet Antivirus Programs.- Security Teams

Unit-5:

MasterCard/Visa Secure Electronic Transaction : Introduction –Business Requirements – Concepts – payment Processing.

E-mail and secure e-mail technologies for Electronic Commerce: Introduction _ The Means of Distribution – A model for Message Handling- MIME, S/MIME, MOSS , MIME and Related Facilities for EDI over the Internet.

Recommended Texts:

Daniel Minoli & Emma Minoli, “Web Commerce Technology Handbook”. Tata McGraw Hill – 1999.

Reference Book:

1.K.Bajaj & D Nag , “E-Commerce”, Tata McGraw Hill – 1999.

2.Mamta Bhusry – “E-Commerce”

COURSE OUTCOMES:

- Define and analyze the concepts of EDI and its legal, social, technical aspects and the security issues over the web. Obtain a general understanding of basic business management concepts.
- Have complete knowledge about basic technical concepts relating to E-Commerce.
- Obtain thorough understanding about the security issues, threats and challenges of E-Commerce.

Elective –II: MULTIMEDIA SYSTEMS
SUBJECT CODE : SEZ6D

COURSE OBJECTIVES

- Able to learn the various available multimedia elements.
- To learn about various text formatting and sound effects, video and audio formats.
- To learn about various animation tools.

Unit-1:

What is Multimedia: Definitions - CD-ROM and the Multimedia Highway - Where to use Multimedia - Introduction to MakingMultimedia: The stages of a Project - What You Need - MultimediaSkills and Training: The team - Macintosh and Windows ProductionPlatforms: Macintosh Versus PC - The Macintosh Platform - The Windows Multimedia PC Platform - Networking Macintosh and Windows Computers-Hardware Peripherals: Connection - Memory and Storage Devices - Input Devices - Output Hardware - Communication Devices.

Unit-2:

Basic Tools: Text Editing and Word Processing Tools - OCR Software - Painting and Drawing Tools - 3-D Modeling and Animation Tools - Image-Editing Tools - Sound Editing Tools - Animation, Video and Digital Movie Tools - Helpful Accessories - Making InstantMultimedia: Linking Multimedia Objects - Office Suites - Word Processors - Spreadsheets - Databases - Presentation Tools.Multimedia Authoring Tools: Types of Authoring Tools - Card-and-Page-Based Authoring Tools - Icon-Based Authoring Tools - Time-Based Authoring Tools - Object-Oriented Authoring Tools - Cross-Platform Authoring Notes

Unit-3:

Text: The Power of Meaning - About Fonts and Faces - Using Text in Multimedia - Computers and Text - Font Editing and Design Tools - Hypermedia and Hypertext - Sound: The Power of Sound - Multimedia System Sounds - MIDI Versus Digital Audio - Digital Audio - Making MIDI Audio - Audio File Formats - Working with Sound on the Macintosh - Notation Interchange File Format (NIFF) - Adding Sound to Your Multimedia Project - Toward Professional Sound: The Red Book Standard - Production Tips

Unit-4:

Images: Making Still Images -Color - Image File Formats. Animation: The Power of Motion - Principles of Animation - Making Animations That Work -Video: Using Video - How Video works - Broadcast Video Standards - Integrating Computers and Television - Shooting and Editing Video - Video Tips - Recording Formats - Digital Video.

Unit-5:

Planning and Costing : Project Planning - Estimating - RFPs and Bid Proposals - Designing and Producing : Designing - Producing - Content and Talent : Acquiring Content - Using Content Created by Others - Using Content Created for a Project - Using Talent - Delivering : Testing - Preparing for Delivery - Delivering on CD-ROM - Compact Disc Technology - Wrapping It Up - Delivering on the World Wide Web.

Recommended Texts:

1. Tay Vaughan - Multimedia: Making it Work. - Fourth Edition - Tata McGraw Hill Edition - 1999.
2. Walterworth John A - Multimedia Technologies and Application - Ellis Horwood Ltd. - London - 1991.
3. John F Koegel Buford - Multimedia Systems - Addison Wesley - First Indian Reprint - 2000.

COURSE OBJECTIVES

- Able to learn the various available multimedia elements.
- To learn about various text formatting and sound effects, video and audio formats.
- To learn about various animation tools.