SEMESTER V-B

Title of the course : **Computer Graphics**

Subject Code : **CS-311**

Weekly load : 7 Hrs LTP 3-0-4

Credit : 5 (Lecture 3, Practical 2)

**Course Outcomes:** At the end of the course, the student will be able to:

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| CO1 | Provide comprehensive introduction about computer graphics system and design algorithms. |
| CO2 | Understand the concept of two dimensional transformations. |
| CO3 | Make the students familiar with techniques of clipping. |
| CO4 | Understand the concept of parallel and perspective projections. |
| CO5 | Describe various hidden surface removal and shading techniques. |

**Theory**

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| **Unit** | **Main Topics** | **Course outlines** | **Lecture(s)** |
| **Unit-1** | 1. Overview of graphics systems | Display devices, physical input and output devices: storage tube graphic displays, Raster Refresh, Plasma Panel Displays, Liquid Crystals | 06 |
| 2. Output Primitives | Point plotting, Line Drawing algorithms  Slope Line Method, DDA algorithms, Bresenhams Line algorithm | 06 |
| 3. Two-dimensional Transformations | Basic transformations-translation, scaling, rotation, Matrix representation and homogenous coordinates, composite transformations, Rotation about an arbitrary point, scaling relative to a fixed point | 06 |
| 4. Windowing and Clipping Techniques | Windowing concepts, clipping algorithms-Line clipping  Cohen-Sutherland algorithm | 06 |
| **Unit 2** | 5. Projections | Parallel projections, perspective projections | 08 |
|  | 6. Hidden-Surface and Hidden-Line Removal | Back face removal method, Depth-buffer method, Scan-line method | 08 |
| 7. Shading Overview | Polygon shading methods: Z-Flat shading, Lambert flat | 08 |

**Total=48**

**Recommended Books:**

1. Computer Graphics, Hearn & Baker, PHI
2. Principles of Interactive Graphics, Newman & Sproul, Mcgraw Hill
3. Computer Graphics-A Programming Approach, Steven Harrington, Mcgraw Hill
4. Computer Graphics, Sinha & Udai, Mcgraw Hill

Title of the course : **Computer Graphics Lab**

Subject Code : **CS-311**

**Course Outcomes:** At the end of the course, the student will be able to:

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| CO1 | Write programs that demonstrate geometrical transformations using various algorithms. |

**LIST OF PRACTICALS**

1. List out and discuss the use of basic graphics functions in graphics.h.
2. WAP to draw a hut or another geometric figure.
3. WAP to implement slope line method.
4. WAP to draw a line using Digital Differential Analyzer (DDA) Algorithm
5. WAP to draw a circle using midpoint algorithm.
6. WAP to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes positive and greater than 1.
7. WAP to draw a line using Bresenham's Line Algorithm (BLA) for lines with slopes negative and greater than 1.
8. WAP to translate about the origin for two Dimensional Object
9. WAP to perform Scaling of a two Dimensional Object
10. WAP to rotate about the origin for two Dimensional Object
11. WAP to implement Two Dimensional Composite Transformations.

Title of the course : **Software Engineering**

Subject Code : **CS-312**

Weekly load : 5 Hrs LTP 3-0-2

Credit : 4 (Lecture 3, Practical 1)

**Course Outcomes:** At the end of the course, the student will be able to:

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| CO1 | Understand the importance and role of the software, process to be followed in the software development life cycle, and requirements of the various process models. |
| CO2 | Apply software design and development techniques, various Implement testing methods at each phase of SDLC. |
| CO3 | Understand the concept of project management and various estimation techniques. |

**Theory**

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| **Unit** | **Main Topics** | **Course outlines** | **Lecture(s)** |
| **Unit-1** | 1. Introduction | Introduction to software engineering, Importance and evolving role of software, Software Characteristics, Software Components, Software Applications, Software Crisis, Software engineering problems, Software Development Life Cycle | 08 |
| 2. Process models | Requirement of software models, Waterfall Model, The Incremental Model, Prototyping, Spiral Model | 08 |
| 3.Design principles | Concept of design principles, problem partitioning, abstraction, and top down and bottom up-design, structured approach, functional versus object oriented approach, | 08 |
| **Unit-2** | 4.Requirement engineering | Types of software requirements, requirement elicitation, requirement elaboration, software requirement specifications, user interface, analysis and design steps of user interface | 08 |
| 5.Testing Strategies | Software testing, strategies and issues, system testing and debugging, types of testing | 08 |
| 6.Project Management | The Management spectrum, project scheduling, software configuration management, reverse engineering, cost estimation, project estimation | 08 |

**Total=48**

**Recommended Books:**

1. Pressman, Roger S., Software Engineering: A Practitioners Approach, McGraw Hill

2. Jalote, Pankaj, Software Engineering, Narosa

3. Schaums Series, Software Engineering, TMH

4. Alexis, Leon and Mathews Leon, Fundamental of Software Engineering, Vikas

Publications.

5. Sommerville, Ian, Software Engineering, AWL, 2000

6. Bell, Software Engineering for students, Pearson Education

Title of the course : **Software Engineering Lab**

Subject Code : **CS-312**

**Course Outcomes:** At the end of the course, the student will be able to:

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| --- | --- |
| CO1 | Understand the process to be followed in the software development life cycle. |
| CO2 | Define, formulate and analyze a project independently as well as in a team from beginning to end. |

**LIST OF PRACTICALS**

1. To study various phases in SDLC using different models.

2. To study the feasibility of particular project.

3. To analyze the project and creating SRS document.

4. Generating DFDs, ER diagrams, UML diagrams in the design phase.

5. Implementation of project.

6. Testing using various test suites.

Title of the course : **Database Management**

Subject Code : **CS-313**

Weekly load : 7 Hrs LTP 3-0-4

Credit : 5 (Lecture 3; Practical 2)

**Course Outcomes:** At the end of the course, the student will be able to:

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| CO1 | Understand functional components of the DBMS. |
| CO2 | Design database schema and study different data models. |
| CO3 | Understand the concept of normalization. |
| CO4 | Understand the concepts of PL/SQL. |

**Theory**

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| **Unit** | **Main Topics** | **Course outlines** | **Lecture(s)** |
| **Unit-1** | 1. Introduction | Database Systems, Database and its purpose, Characteristics of the database approach, Advantages and disadvantages of database systems. | 06 |
| 2. Classification of DBMS Users | Classification of DBMS Users; Actors on the scene, Database Administrators, Database Designers, End Users, System Analysts and Application Programmers, Workers behind the scene | 06 |
| 3. Database System Concepts and Architecture | Data models, schemas, instances, data base state. DBMS Architecture; The External level, The conceptual level, The internal level | 06 |
| 4. Mappings | Mappings. Data Independence; Logical data Independence, Physical data Independence. | 03 |
| **Unit-2** | 5. Data Models | Relational Data Model, Network Data Model, Hierarchical Model | 08 |
|  | 6. Data Modeling using E.R. Model | Entities and Attributes, Entity types and Entity sets, attribute and domain of attributes, Relationship among entities. | 05 |
| 7. Keys | Key, Different types of keys, Integrity Principles. | 06 |
| 8. Normalization | Functional dependencies, First, Second and Third  normal forms, Boyce/Codd normal form. | 08 |

**Total=48**

**Recommended Books:**

1. Tanenbaum, Computer Network, Prentice Hall India
2. William Stalling, Data and Computer Communication, Prentice Hall
3. Douglas E. Comer, Internetworking with TCP/IP Volume  I, Prentice Hall India
4. W. Richard Stevens, TCP/IP Illustrated Volume-I, Pub. Addison Wesley
5. B. Forouzan, Data Communication And Networking, TMH

Title of the course : **Database Management Lab**

Subject Code : **CS-313**

**Course outcomes:** At the end of the course, students will be able to:

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| --- | --- |
| CO1 | Devise queries using DDL, DML, DCL and TCL commands. |
| CO2 | Develop application programs using PL/SQL. |
| CO3 | Create views, forms and reports. |
| CO4 | Familiarization with different types of keys. |

**LIST OF PRACTICALS**

1. Introduction to various constraints such as Primary key, secondary key, Super key, etc.

2. To study Data Definition Commands (create, drop).

3. To study Data Manipulation Commands (insert, delete, update, select)

4. To study Data Control Commands (Commit, revoke, rollback, connect, execute)

5. Create Table, SQL for Insertion, Deletion, Update and Retrieval using aggregating functions.

6. Write Programs in PL/SQL, Understanding the concept of Cursors.

7. Write Program for Join, Union & intersection etc.

8. Creating Views, Writing Assertions, and Triggers.

9. Creating Forms, Reports etc.

10. WAP in PL/SQL for adding two numbers.

11. WAP in PL/SQL for reversing the number. For example the number is 12345 and

reverse number will be 54321.12) WAP in PL/SQL to find the number is even or odd.

12. WAP in PL/SQL to count numbers from 1 to 100.

Title of the course : **System Analysis & Design**

Subject Code : **CS-314**

Weekly load : 3 Hrs LTP 2-1-0

Credit : 3 (Lecture 2, Tutorial 1)

**Theory**

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| **Unit** | **Main Topics** | **Course outlines** | **Lecture(s)** |
| **Unit-1** | 1. Introduction | Concept of System, characteristics and elements of a system, types of system | 02 |
| 2. System Analyst | Role of system analyst, system analyst in MIS organization | 04 |
| 3. SDLC | Concept of system development life cycle approaches to system development, system investigation, system analysis. | 04 |
| 4. System Analysis Tools | Information gathering tools, structured analysis tools, Context diagram, DFD, decision table, data dictionary and decision tree | 06 |
| **Unit-2** | 5.Feasibility analysis | Feasibility study and analysis, cost benefit analysis, categories of cost and benefits, procedure for cost benefit analysis. | 04 |
| 6.System Design | Logical and physical design**,** Database design, input, output form design, security issues, report design. | 04 |
| 7.System Testing | Concepts, issues involved in system testing and Types of testing, trends in testing and role of test data and data processing. | 04 |
| 8.System Maintenance | System conversion activities of conversion, post implementation reviews, maintenance and enhancement of software | 04 |

**Total=32**

**Recommended Books:**

1. EM Awad, System Analysis and Design, Galgotia Publications
2. Hawrysxkiewycz ,Introduction to System Analysis and Design, Prentice Pvt. Ltd.

Title of the course : **Visual Programming Lab**

Subject Code : **CS-315**

Weekly load : 4 Hrs LTP 0-0-4

Credit : 2 (Practical 2)

**Course Outcomes:** At the end of the course, the student will be able to:

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| CO1 | Students will be able to learn visual programming basics and its components. |
| CO2 | Make the students familiar with control structure and functions used in Visual Programming. |
| CO3 | Cover visual programming skills needed for modern software development. |

**LIST OF PRACTICALS**

1. Study and understand Visual Basic Programming Environment
2. Design a GUI using a form to print a line of text on the form. The form should contain two buttons print and Exit.
3. Design a GUI which accepts two integers number, compute their sum and display the result. Use appropriate labels, text boxes and buttons.
4. Write a program that inputs two different integers using the function Input Box
5. Compare the three numbers using the if-then-else statement
6. Develop a class- averaging program that will process an arbitrary number of grades each time the program is run. Use sentinel controlled statement.
7. WAP that draws a square of # characters on the form. The side of the square be input by the user and should be in the range 1 through 12. Use nested controlled structures
8. WAP to print the numbers from 1 to 10 using Do- While control structure
9. WAP to print the numbers from 1 to 10 using Do- until Loop repetition structure
10. WAP to demonstrate the use of Exit, Do Exit statement
11. WAP that demonstrate the use Data Types and operators
12. WAP that finds the minimum of three numbers input, use a programmer defined sub procedure MINIMUM, to determine the smallest of three integers
13. WAP to demonstrate the use of programmer defined function procedure
14. WAP to demonstrate passing arguments by value and by reference
15. WAP to demonstrate Exit Sub and Exit function statement
16. WAP to demonstrate the scoping issues of module variables, local variables and static local variables
17. WAP to compare two strings using function Strcomp and relational operators.
18. WAP to reverse a string using function Mid, $ and Len
19. WAP for searching substrings in strings using Instr and InstrRev
20. WAP to remove leading & trailing spaces on a string using Ltrim, Rtrim & Trim
21. WAP to replace substring in a string with function replace
22. WAP to reverse a string a string with function strreverse
23. WAP to convert string to all uppercase letters using Ucase $ and all lowercase letters using Lcase $
24. A government Lab wants to install a security Keypad outside a laboratory room. Only authorized persons may enter lab using their security codes. The following are valid security codes:

Technicians 1645-1989

Custodians 8345

Special Services 55875

Chief Scientist 999898

Scientist 1000007-1000008

As an added security measure, the keypad treats any access less than 1000 as panic code by sounding a single beep. Although when access is denied security is notified immediately, once an access code is entered, Access is either granted or denied. All access attempts are written to a window below the keypad. If access is denied the date, time and message Access Denied are written to the window. Use Select case (Multiple Selection structure)

1. WAP to develop a quadratic calculator using different intrinsic controls in VB
2. WAP to create a pop- up menu using the Menu Editor. The form contains a Label displaying the word text. Right clicking the form should display a pop-up menu from which end user can select Right, Center or Left to justify the Text.
3. Develop a program to create a Digital Clock using timer control
4. Develop a notepad using various Active X Common Dialog Controls available in VB
5. Explore the different controls for database connectivity in VB
6. Design a program for transaction processing of a banks account information. The program should update existing accounts, adds new accounts, deletes accounts and store a list of all current accounts in a text for printing with backend as MS-Access