

Teaching Plan
Jan - 2022

Name of the Faculty : Sudhir Kumar Gupta

Name of the Course : B. Sc. (H) CBCS - Computer Science

Semester : VI

Section (if any) : A

Title of the Paper: Computer Graphics

Month	Topics Covered	References
Jan 2022	Introduction: Basic elements of Computer graphics, Applications of computer graphics. Graphics Hardware: Architecture of Raster and Random, scan display devices, input/output devices.	[2]
	Drawing Primitives: Raster scan line, circle and ellipse drawing algorithms	[1]
	Practical : Computer Graphics basics, Line and Circle Drawing Algo	
Feb 2022	Drawing Primitives: Polygon filling, line clipping and polygon, clipping algorithms	[1]
	Viewing And Transformations: 2D Geometric, Transformations, 2D Viewing, Transformations	[3]
	Practical : Line Clipping, Polygon Clipping, Polygon Filling	
	Test 1 : 2nd Week of Feb	
March 2022	Viewing And Transformations: 3D Geometric, Transformations, 3D Viewing, Transformations, Vanishing points.	[3]
	Geometric Modeling: Representing curves (Hermite and Bezier)	[3]
	Practical : 2D/3D transformations	
	Test 2 : 3 rd Week of March	
April 2022	Visible Surface determination: Z-buffer algorithm, Depth Sort algorithm and Warnock's algorithm Surface rendering: Color Models, Illumination and shading models, Computer Animation	[2]
	Practical : Curves drawing (Hermite and Bezier)	

Text Books:

1. Computer Graphics: Principles and Practice 2nd Edition in C, James D. Foley , Andries Van Dam, Steven K. Feiner , John F. Hughes , Pearson Education Asia, 1999.
2. Computer Graphics C version (2nd Edition), D. Hearn, M.P. Baker: Pearson Education, 2006.
3. Mathematical Elements for Computer Graphics 2nd Edition, D.F. Rogers, J. A. Adams, Mc Graw Hill 2nd edition , 2002.

Course Objective

This course introduces fundamental concepts of Computer Graphics with focus on modelling, rendering and interaction aspects of computer graphics. The course emphasizes the basic principles needed to design, use and understand computer graphics system.

Course Learning Outcomes

On successful completion of the course, students will be able to:

1. Describe Standard raster and vector scan devices as well as Graphical Input and output devices
2. Implement algorithms for drawing basic primitives such as line, circle and ellipse.
3. Implement algorithms for line clipping and polygon clipping and filling.
4. Implement a 3D object representation scheme and carryout 2D and 3D Transformation, 3D projections
5. Implement visible surface determination algorithms, Illumination models and surface rendering methods, color models
6. Implement a simple computer animation algorithm

Teaching Plan

April - 2022

Name of the Faculty : Sudhir Kumar Gupta

Name of the Course : B. Sc. (H) CBCS, GE -2

Semester : II

Section (if any) :

Title of the Paper : DBMS

Month	Topic	Chapter	Reference
April 2022	Introduction: Introduction to database, relational data model, DBMS architecture, data independence and data abstraction, DBA, database users, end users, front end tools.	1.1-1.6 2.1-2.3	1
	Data Modeling: Entity types, entity set, attribute and key, relationships, relation types, ER diagrams, database design using ER diagrams.	3.2-3.7, 3.9, 3.10	1
May 2022	Relational Data Model: Relational model concepts, relational constraints, primary and foreign key, candidate key, alternate, composite, super-key.	5.1-5.2.4	1
Jun 2022	Data Redundancy, Normalization: 1NF, 2NF, 3NF.	14.1-14.4	1
July 2022	Structured Query Language: Introduction to SQL, concepts of Data Definition Language (DDL) and Data Manipulation Language (DML), DDL queries like create a data base, drop a database, create table, drop table, alter table, DML queries like inserting data in a table, update in a table, delete data from a table, filter data. Create relationships between database tables, auto increment, check, Null values, aggregate functions - min, max, count, average, sum, nested sub-queries, group by, having, exists, case, order by. Join operations - inner, left join, right join, natural join and Cartesian product. Overview of forms and reports.	6.1-6.4 7.1, 7.4	1

References

1. Elmasri, R., & Navathe, S. (2017). *Fundamentals of Database Systems*. 7th edition. Pearson Education.

Additional References

2. Bayross, I. (2010) *SQL, PL/SQL the Programming Language of Oracle*. 4th edition. BPB Publications.

3. Silberschatz, A., Korth, H. F., & Sudarshan, S. (2011), *Database System Concepts*. 6th edition. Tata McGraw-Hill Education.

Course Objectives

The course introduces the concepts of database management systems to students, focusing on basics such as the importance and significance of a database, data model, schema creation and normalization.

Course Learning Outcomes

On successful completion of the course, students will be able to:

- Describe the features of database management systems.
- Differentiate between database systems and file systems.
- Model an application's data requirements using conceptual modelling tools like ER diagrams and design database schemas based on the conceptual model.
- Write queries in relational algebra / SQL.
- Normalize a given database schema.