

**BCA (HONS) 6<sup>th</sup> SEMESTER  
DISCIPLINE SPECIFIC COURSE (CORE)**

**BCA620C2: COMPUTER GRAPHICS**

**CREDITS: THEORY: 4; PRACTICAL: 2  
MAX. MARKS: THEORY: 60; PRACTICAL: 30  
MIN. MARKS: THEORY: 24; PRACTICAL: 12**

**THEORY: 60 LECTURES**

**UNIT-I**

**1. Introduction (7 Lectures)**

Basic elements of Computer graphics, Applications of Computer Graphics.

**2. Graphics Hardware (8 Lectures)**

Architecture of Raster and Random scan display devices, input/output devices.

**UNIT-II**

**3. Fundamental Techniques in Graphics (15 Lectures)**

Raster scan line, circle and ellipse drawing, thick primitives, Polygon filling, line and polygon clipping algorithms, 2D and 3D Geometric Transformations, 2D and 3D Viewing Transformations (Projections- Parallel and Perspective), Vanishing points.

**UNIT-III**

**4. Geometric Modeling (15 Lectures)**

Representing curves & Surfaces.

**UNIT-IV**

**5. Visible Surface determination (8 Lectures)**

Hidden surface elimination.

**6. Surface rendering (7 Lectures)**

Illumination and shading models. Basic color models and Computer Animation.

**Books Recommended:**

1. J.D.Foley, A. Van Dam, Feiner, Hughes Computer Graphics Principles & Practice 2<sup>nd</sup> edition Publication Addison Wesley 1990.
2. D.Heam, Baker: Computer Graphics, Prentice Hall of India 2008.
3. D.F.Rogers Procedural Elements for Computer Graphics, McGraw Hill 1997.
4. D.F.Rogers, Adams Mathematical Elements for Computer Graphics, McGraw Hill 2<sup>nd</sup> edition 1989.

**LAB: COMPUTER GRAPHICS**

**(CREDITS: 2; 60 LECTURES)**

1. Write a program to implement Bresenham's line drawing algorithm.
2. Write a program to implement mid-point circle drawing algorithm.
3. Write a program to clip a line using Cohen and Sutherland line clipping algorithm.
4. Write a program to clip a polygon using Sutherland Hodgeman algorithm.
5. Write a program to apply various 2D transformations on a 2D object (use homogenous coordinates).
6. Write a program to apply various 3D transformations on a 3D object and then apply parallel and perspective projection on it.
7. Write a program to draw Hermite/Bezier curve.