

# COMPUTER GRAPHICS

## 1. Introduction

**Objective:** This being the first course in computer graphics introduces the basics of the subject.

**Credits: 3-0-1**

## 2. Course Outline

### UNIT - I: Introduction

History, Advantages, Applications, Graphics I/O Devices, Raster Graphics, Graphics Packages and Libraries, Line and Circle Drawing Algorithms, Scan Conversion, Polygon Filling.

### UNIT - II: Geometric Transformations and Clipping

2D Transformations, Homogeneous Coordinate System, 3D Transformations, Plane Geometric Projections, Viewing Transformations, Line and Polygon Clipping..

### UNIT - III: Curves and Surfaces

Parametric Representation of Curves, Cubic Splines, Bezier Curves, B-Splines, Parametric Surfaces, Surfaces of Revolution, Sweep Surfaces, Quadric Surfaces, Fractal Curves and Surfaces.

### UNIT - IV: Realism in 3D Graphics

Hidden Line and Hidden Surface Removal Algorithms, Illumination Models, Phong and Gouraud Shading.

## 3. Reading Material

### Text Books

1. D. F. Rogers: Procedural Elements for Computer Graphics, Tata McGraw Hill
2. D. F. Rogers and J.A. Adams: Mathematical Elements for Computer Graphics, Tata McGraw Hill
3. J. D. Foley, A. VanDam, S.K. Feiner. and J.F. Hughes: Computer Graphics: Principle and Practice, Pearson Education.
4. Z. Xiang and R. Plastock: Computer Graphics, Tata McGraw Hill edition, Pearson Education.

### Reference Books

1. E. Angel: OpenGL - A Primer, Pearson Education
2. D. Shreiner, G. Sellers, J. Kessenich, B. Licea-Kane: OpenGL Programming Guide, Pearson Education.
3. T. McReynolds and D. Blythe: Advanced Graphics Programming Using OpenGL, Elsevier
4. Nehe OpenGL Tutorials @ <http://nehe.gamedev.net>..

### Suggested Assignments

Programming Assignments Based on Line and Circle Drawing, Polygon Filling Algorithms, 2D, 3D & Viewing Transformations, Fractal Curves, Hidden Line/Hidden Surface