Computer Graphics Syllabus

Unit I – Introduction to computer graphics & graphics systems
Overview of computer graphics, storage tube graphics display, Raster scan display. Points & lines, Line drawing algorithms, DDA algorithm, Bresenham's line algorithm, Circle generation algorithm, Ellipse generating algorithm, scan line polygon, fill algorithm, boundary fill algorithm, flood fill algorithm.

Unit II – 2D transformation & viewing
Basic transformations: translation, rotation, scaling, Matrix representations & homogeneous coordinates, transformations between coordinate systems, reflection shear, Transformation of points, lines, parallel lines, intersecting lines. Viewing pipeline, Window to viewport coordinate transformation, clipping operations, point clipping, line clipping, clipping circles, polygons & ellipse.

Unit III – **3D transformations**
Translation, rotation, scaling & other transformations. Rotation about an arbitrary axis in space, reflection through an arbitrary plane, general parallel projection transformation; clipping, viewport clipping, 3D viewing.

Unit IV – Curves
Curve representation, surfaces, designs, Bezier curves, B-spline curves, end conditions for periodic B-spline curves, rational B-spline curves. Hidden surface Detection: Depth comparison, Z-buffer algorithm, Backface detection, BSP tree method, the Printer's algorithm, scan-line algorithm, Hidden line elimination, wireframe methods.

Unit V – **Color & shading models**
Light & colour model, interpolative shading model, Flat shading, Phong shading, Gouraud shading, Lambert lighting model, Phong lighting model, Blinn-Phong lighting model, Texture.