

Course Title and Code	CS341-Computer Graphics
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I. **Course Identification and General Information:**

Course Title	Computer Graphics	Course Code	CS341	Pre-requisite	CS182
Department	Computer Science	Course Level	7	Credit Hours	3(2+1)

II. **Course Description/Topics:** The following course topics will be covered.

- Computer Graphics Applications Survey.
- **Color models** (chromaticity diagram, RGB, CMY, YIQ, HSV, and HLS color models).
- **Graphics Output Primitives** (coordinate frames, DDA, Bresenham's algorithm, circle-drawing, fill-area primitives algorithms).
- **2D Graphics** (2D Cartesian coordinates, curves and parametric equations, functions and transformations, inverse functions).
- **3D Graphics** (vectors in 3D, dot and cross product, homogeneous coordinates, correlation between Cartesian and homogeneous coordinates).
- **Geometric transformations** (2D geometric transformations, matrix representation and homogeneous coordinates, inverse transformations, 2D composite transformations).
- **Geometric representation** (Lagrange polynomials of degree n, Hermite cubic polynomial, Bernstein polynomial, interpolation problem, Spline interpolation, problem of approximation, Bezier-Bernstein approximation, Bezier-B-Spline approximation, quadric surfaces).

III. **Course Outcomes:** Summary of the main learning outcomes for students enrolled in the course.

- Identify common uses of computer graphics.
- Describe the computer generation and manipulation of images.
- How humans use vision to perceive information.
- How information can be rendered on a display device
- How images can be represented by pixels.
- Describe color models and their use in graphics display devices.
- How animation can be created as a sequence of still images.
- Describe the basic process of producing continuous motion from a sequence of discrete frames.
- Describe how double-buffering can remove flicker from animation.

IV. **Required Text:**

- Hearn, D. and P. Baker "Computer Graphics with OpenGL". Pearson Prentice Hall, Pearson Education Inc., Upper Saddle River, NJ07458, USA, 2004. PIE ISBN 0-13-120238-3.

V. **References:**

- Hill, F.S., "Computer Graphics using Open GL", 2nd ed., Prentice Hall, 2001
- Edward Angel, "Interactive Computer Graphics, A Top-Down Approach with OpenGL", Third Edition, Addison Wesley Longman, 2003