



SYLLABUS

Course Title	Computer Graphics with C
Course Code	BCA614
Course Credit	Theory(Hrs) : 3
	Practical(Hrs) : 0
	Tutorial(Hrs) : 0
	Credits : 3

Course Objectives

The objectives of the course are:

- To understand fundamentals concepts and theory of computer graphics
- To impart practical experience in the drawing of 2D objects using graphics functions
- To provide an understanding of the algorithms and theories that forms the basis of computer graphics and modelling
- To design and implement model and viewing transformations, the graphics pipeline and an interactive render loop with a 3D graphics
- To learn the computational methods for modelling of motions in the physical and virtual world

Detailed Syllabus

Sr. No.	Name of chapter & details	Hours Allotted
Section – I		
1	Basics of Computer Graphics Computer Graphics, Applications of Computer Graphics, Video Display Devices/Output Devices: Refresh Cathode –Ray Tubes, Direct View Storage Tubes, Flat Panel Displays, Raster-Scan Display System and Random Scan System, Hard Copy Devices. Interactive Input Devices: Keyboards, Touch Panels, Light Pens,	05

	Graphics Tablets, Joysticks, Trackball, Mouse, Voice Systems, Logical Classification Of Input Devices, Locator Devices, Stroke Devices, String Devices, Valuator Devices, Choice Devices, Pick Devices	
2	Implicit Functions for Computer Graphics Text Mode & Graphics Mode, Resolution, 2D Co-ordinate System, Graphics Functions	04
3	Graphics Primitives Point Plotting Techniques, Qualities of good line drawing algorithms, Line Drawing Algorithms - DDA Algorithm, Bresenham's Algorithm and Midpoint line Algorithm, Circle Generating Algorithms - Bresenham's Algorithm and Midpoint Circle Algorithm	06
4	Polygons Introduction, Types of Polygon, Polygon Representation: Inside Test, Even odd method, Polygon Area Filling Algorithms: Boundary Fill, Flood Fill, Scan Line, Anti-aliasing	06
Section – II		
5	Two Dimensional Graphics Basic of Transformation , Matrix Formation, 2D Transformations- Translation, Rotation and Scaling, Homogeneous Co-ordinates, Composite Transformations, Other Transformation(Reflection and Shear)	05
6	Clipping and Windowing Need for Clipping and Windowing, Window to viewpoint Transformation, Line Clipping Algorithms, Midpoint Subdivision Method, Polygons Clipping Method	06
7	Three Dimensional Graphics Introduction to 3D Imaging, 3D Geometry, 3D Transformations- Translation, Rotation and Scaling, 3D Viewing, Projections - Parallel Projections, Perspective Projections	06
8	Introduction to Advanced Graphics Concepts Animation, Key-Frame Animation, Procedural Animation, Key-Frame Vs. Procedural Animation, Introduction to Morphing	04

Instructional Method and Pedagogy:

- Lectures will be conducted on the basis of Classroom Response Systems with the use of multimedia projector and black board.
- Assignments based on course contents will be given at the end of each unit/topic and will be evaluated at regular interval.

Course Learning Outcomes:

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

- **Discuss** the fundamental of computer graphics
- **Demonstrate** and **understand** the production process pipeline appropriate to the field of computer graphics and animation
- **Differentiate** the most common modeling approaches
- **Design** objects using pinning principles of 2D graphics and 3D graphics
- **Apply** knowledge to solve computer graphics and animation problems
- **Use** software tools to create and manipulate graphic images, animations and 3D models in multiple formats

Text books:

- Title :Computer Graphics C Version, Pearson Education
Author(s): D.Hearn And P.Baker.

Reference Books:

- Title :Procedural Methods for computer graphics, TMH
Author(s): Rogers
- Title : Computer Graphics, Person Education
Author(s): Foley and van Dam
- Title: Computer Graphics with virtual reality systems, Wiley-India
Author(s): R. K. Maurya
- Title: Computer Graphics, TMH
Author(s): Sinha & Udai,
- Title: Computer Graphics
Author(s):Peter Shirley, Steve Marschner, Cengage

Additional Resources

- <http://freevidelectures.com/blog/2010/11/130-nptel-iit-online-courses/>
- <http://www.dgp.toronto.edu/~hertzman/418notes.pdf>
- <http://www.bcanotes.com/ComputerGraphics.html>
- <http://uandme2share.blogspot.in/2012/08/computer-graphics-programs-built-in.html>