

2/4 B.Tech SECOND SEMESTER

IT4L2

**COMPUTER GRAPHICS LAB
(Using C Programming)
(Common to CSEIT)**

Credits: 2

Lecture: ---

Internal assessment: 25 marks

Lab:- 3 periods /week

Semester end examination: 50 marks

Objectives:

- To explain the simple basics of OpenGL by displaying the points, line and circle on a plane.
- Explain how to work with the transformations in graphics through OpenGL by displaying the color cube and spin it.
- Explain how to perform the clipping algorithms in OpenGL.
- Explain how to perform the polygon filling using scan line method.

Outcomes:

Students will be able to

- Develop and build an interactive graphics program to display points, line and circle using the OpenGL application programming.
- Gain proficiency with OpenGL to produce transformations in graphics and perform rotations.
- Build an interactive graphics program to perform clipping in OpenGL.
- Develop and build an interactive graphics program to perform polygon filling using scan line method.

Exercises:

1. Write a program to draw points on a plane in OpenGL.
2. Write a program to draw a line on plane in OpenGL.
3. Write a program to draw circle on plane in OpenGL.
4. Write a program draw a white rectangle on a black background in OpenGL.
5. Write a program to draw a color cube and spin it using OpenGL transformation matrices in OpenGL.
6. Write a program to create a house like figure and rotate it about a given fixed point using OpenGL functions in OpenGL.
7. Write a program to implement the Cohen-Sutherland line clipping algorithm. Make provision to specify the input line, window for clipping and viewport for displaying the clipped image in OpenGL.
8. Write a program to fill any given polygon using scanline area filling algorithm in OpenGL.
9. Program to display a set of values $\{f_{ij}\}$ as a rectangular mesh. Rectangular Mesh using set of points $f(i,j)=f(x_i,y_j)$ where $x_i=x_0+i*dx$, $y_j=y_0+j*dy$.

Reference Books:

1. "Computer Graphics through OpenGL", Sumantha Guha, Chapman and Hall/CRC 2011.
2. "OpenGL graphics through applications", Robert Whitrow, Springer 2008.