

**CENTRAL UNIVERSITY OF KERALA
DEPARTMENT OF COMPUTER SCIENCE
M.Sc. COMPUTER SCIENCE**

CORE COURSE					
COURSE CODE	COURSE TITLE	CONTACT HRS/WEEK			CREDITS
		LEC	LAB	TUT	
CSC5203	Computer Graphics and Visualization	2	2	1	4

Lec = Lecture, Tut = Tutorial, Lab = Practical

This is an experimental and problem solving **skill development course**.

Course Objective

The objective of the course is to provide theoretical and practical aspects of computer graphics.

By completing this course, students will obtain the following course/learning outcomes:

1. Knowledge gained:
 - (i) Mathematical concepts of computer graphics and visualization
2. Skill gained:
 - (ii) modelling of 2D and 3D transformations.
 - (iii) Projection from 3D to 2D
 - (iv) Implementing Clipping algorithms.
3. Competency gained:
 - (v) Development of algorithms for various techniques in computer graphics

Prerequisites: Basic knowledge in mathematics.

Grading:

Lab experiments and implementation	– 15%
Participatory based group Project	– 10%
Mini project (individual)	– 5%
Class Test/Assignment/Quiz/presentation	– 10%
Final Exam	– 60%

CSC5203 - Computer Graphics and Visualization

Module 1

History of computer graphics. Introduction to OpenGL. Raster algorithms – DDA and Bresenham’s line drawing algorithms, Circles and Ellipse drawing algorithms.

Module 2

Geometric transformation in 2D space – translation, rotation, scaling, reflection. Homogenous co-ordinates and Composite transformation. Affine transformation. Two Dimensional Viewing transformation – Line/Polygon Clipping.

Module 3

Geometric transformation in 3D space – translation, rotation, scaling, reflection. Projections.

Module 4

Knowledge about Visible–Surface Detection. OpenGL light and material properties and models. Color Models and Color Applications: RGB – YIQ – CMY – HSV.

Reference:

1. Donald Hearn and M. Pauline Baker, ‘Computer Graphics C Version’, Prentice – Hall of India, Second Edition, 1997
2. Hill, Francis S., Computer Graphics Using OpenGL, Prentice-Hall, 2001.
3. Sumanta Guha, Computer Graphics through OpenGL, CRC Press, 2011.
4. D.D. Hearn, M.P. Baker, Computer Graphics with OpenGL, 4/e, pearson, 2011
5. Dave Shreiner, “OpenGL Programming Guide: The Official Guide to Learning OpenGL, Versions 3.0 and 3.1”, Addison Wesley, 7th Ed., 2009