

University of Mosul
College of Engineering
Department: Computer



Course Title:3D Computer Graphics
Course Number/Type:
Credit Hours: 2 hours/week
Level/Term: MSC
Prerequisites:

Course Description:

This course involves all the required stages to display 3D objects which is called 3D graphics pipeline. This pipeline contains many stages related with many algorithms for Transformations, scan conversion , clipping and hidden surface removals and finally how to save the data in the frame buffer for displaying. Also the course involves many topics for GPU programming and architecture. In programming part, the CUDA C language is covered.

References:

- 1- Ferguson, R. Stuart - Practical Algorithms for 3D Computer Graphics, Second Edition-CRC Press (2013).
- 2- Gabriel Gambetta - Computer Graphics from Scratch_ A Programmer's Introduction to 3D Rendering-No Starch Press (2021).

Course Details:

Subject	Week
Introduction to 3D Computer Graphics	1
Connectors and signals (VGA, HDMI, ...)	2
3D Transformations (Rotate , scale, translate...)3D rotation about an arbitrary axis	3
3DDA scan conversion ,3D Bresenham’s algorithm, Ray tracing	4
Hidden surface removals algorithms	5
Review 2D clipping	6
Polygon clipping	7
3D Sutherland clipping algorithm (6 planes)	8
Mid course exam	9
3D Sutherland clipping algorithm (4 planes)	10
GPU architecture	11
GPU programming, CUDA examples	12
Triangulations and tessellations	13
Illumination, texture and shading models	14
VR and AR	15