

Dept Number	CS 485	Course Title	Computer Graphics							
Semester Hours	3	Course Coordinator	Christos Mousas							
Catalog Description	Principles and techniques of computer graphics. Interactive graphics software development using a modern graphics standard such as OpenGL. Topics include: primitives, transforms, clipping, modeling, viewing, texture, lighting and shading. Advanced rendering and modern graphics hardware.									
SP15										
Textbooks										
SP17										
<p><i>Fundamentals of Computer Graphics</i>, Shirley & Marschner, 2015, ISBN 978-1482229394, AK Peters/CRC Press, 4th Ed.</p> <p><i>Open GL Programming Guide: The Official Guide to Learning OpenGL, Version 4.5 with SPIR-V</i>, Kessenich, Sellers & Shreiner, 2016, ISBN 978-0134495491, Addison-Wesley, 9th Ed.</p>										
References										
SP15										
Course Learning Outcomes										
<ul style="list-style-type: none"> To learn the principles of modern computer graphics. To be able to design and implement computer graphics models and applications. 										
Assessment of the Contribution to Student Outcomes										
SP15										
Outcome →	1	2	3	4	5	6	7	8	9	10
Assessed →	X	X	X	X	X					
Prerequisites by Topic										
CS 306 with a grade of C or better; Mathematics 150 and 221 are recommended.										

Major Topics Covered in the Course

1. Introduction: applications, basic concepts, overview {3 classes}
2. Graphics programming and the OpenGL API, primitives, attributes {4 classes}
3. Graphics devices: CRTs, random scan and raster scan, input devices, etc {3 classes}
4. Interactive input methods: input devices (logical and physical), handling user events and interactions {3 classes}
5. 2-D Graphics: transformations, matrix representations, composite transformations {4 classes}
6. Graphics client/server; display lists; hierarchical modeling {3 classes}
7. 3-D Graphics: primitives, transforms, hidden surface removal {4 classes}
8. Clipping and viewpoints, clipping algorithms {3 classes}
9. 3-D Viewing and projections {4 classes}
10. Object representations, CSG, sweeps etc {3 classes}
11. Lighting, texture, ray tracing, anti-aliasing, animation {6 classes}