

Dept Number	CS 485	Course Title	Computer Graphics							
Semester Hours	3	Course Coordinator	Michael Wainer							
Catalog Description	Principles and techniques of computer graphics. Interactive graphics software development using a modern graphics standard. Topics include: primitives, transforms, clipping, modeling, viewing, rendering, texture, animation and ray tracing. A group project is an integral part of this course.									
Textbooks										
Computer Graphics with OpenGL, 4 th edition, by Donald Hearn, Prentice Hall, 2011.										
References										
References to OpenGL, JOGL and documentation for other graphics packages used in projects.										
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 Program Outcomes										
Outcome →	1	2	3	4	5	6	7	8	9	10
Assessed →	X	X	X	X	X	X				
Prerequisites by Topic										
306 with a grade of C or better; Mathematics 150 and 221 are recommended.										

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Major Topics Covered in the Course		
<ol style="list-style-type: none"> 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} 		
Major Lab Assignments and Projects		
<p>Labs covering:</p> <ul style="list-style-type: none"> 2D graphics and interaction 3D object modeling and viewing 3D animation (development as a team is required) 		
Assessment Plan for the Course		