

<b>Course Number</b>	<b>CS 485</b>	<b>Course Title</b>	<b>Computer Graphics</b>			
<b>Semester Hours</b>	<b>3</b>	<b>Course Coordinator</b>	<b>Tong Shu</b>			
		FA20				
<b>Catalog Description</b>	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						
<b>Textbooks</b>						
SP21						
Kessenich, J., Sellers, G. & Shreiner, D. (2016). <i>Open GL Programming Guide: The Official Guide to Learning OpenGL, Version 4.5 with SPIR-V.</i> , Addison-Wesley, 9 <sup>th</sup> Edition. ISBN 978-0134495491.						
Kaeli, D., Mistry, P., Schaa, D., and Zhang, D.P. (2015). <i>Heterogeneous Computing with Open CL 2.0.</i> Morgan Kaufmann, 3 <sup>rd</sup> edition. ISBN: 9780128014141.						
<b>References</b>						
SP15						
<b>Course Learning Outcomes</b>						
<ul style="list-style-type: none"> <li>• To learn the principles of modern computer graphics.</li> <li>• To be able to design and implement computer graphics models and applications.</li> </ul>						
<b>Assessment of the Contribution to Student Outcomes</b>						
SP20						
<b>Outcome →</b>	1	2	3	4	5	6
<b>Assessed →</b>	X	X				X
<b>Prerequisites by Topic</b>						
CS 306 with a grade of C or better or graduate standing; 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}