

Fall 2020

Computer Graphics (CE)

527970

Fall 2020

9/3/2020

Kyoung Shin Park
Computer Engineering
Dankook University

Course Information

□ Course

- Computer Graphics (CE) (527970)
- Fall 2020, 3 credits, 3 hours
- Course hour: Thursday 9:00-12:00 (2nd Engineering 420)

□ Instructor

- Kyoung Shin Park
- kpark@dankook.ac.kr
- 031-8005-3161 (office) 010-8636-1960 (mobile)
- 2nd Engineering Building, Room 512
- Office hour: by appointment

□ Prerequisite courses

- Data Structure, C/C++ Programming

Purpose

- This course will study the theory and processing of 2D and 3D computer graphics. To do this, we practice the graphics processing technique in a simple form using the OpenGL 3D graphics library based on the theory of computer graphics. This course aims to cultivate students' ability to create interactive computer graphics.

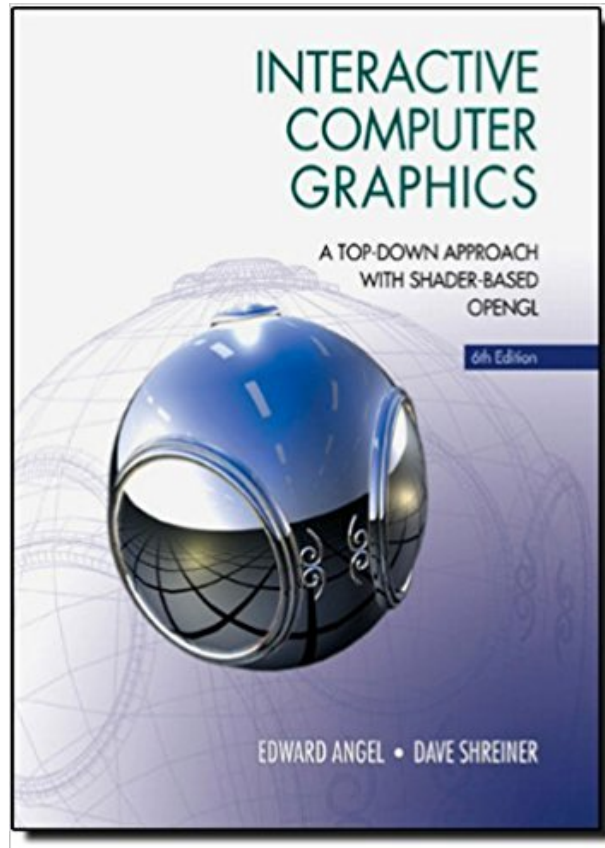
Purpose

1. Understanding the basic concepts and mathematics required for computer graphics
2. Comprehension of computer graphics teaching materials and programming examples, and analysis and resolution
3. Explain application to engineering using basic theory of computer graphics
4. Acquire technical methods required for computer graphics, use of integrated development environment of Visual Studio, and acquire OpenGL programming

Text Book

□ Textbook

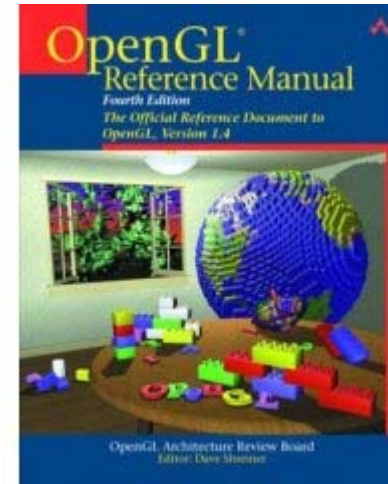
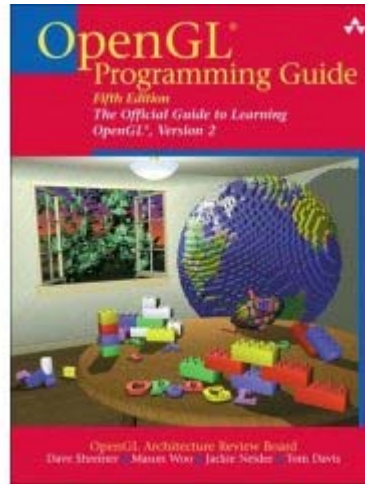
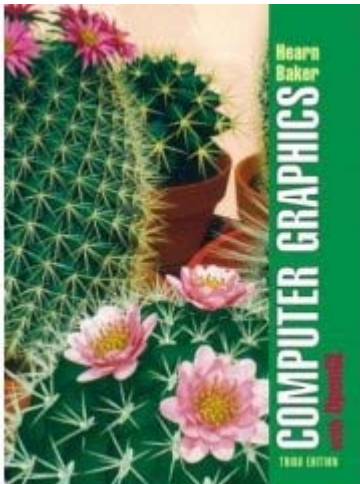
- Interactive Computer Graphics: A Top Down Approach Using Shader Based OpenGL" 6th Edition
- Edward Angel



Text Book

□ Reference Book

- Computer Graphics with OpenGL, Hearn Baker, Prentice Hall
- OpenGL Programming Guide (The Red Book)
- OpenGL Reference Manual (The Blue Book)



Evaluation

- Attendance: 10%
- Midterm Exam: 30%
- Final Exam: 40%
- Project: 20 %
- Class Participation & Attitude: extra 10%

Topics

- Overview
- OpenGL programming
- Graphics systems
- Input and interactions
- Geometric objects
- Transformations – translation, rotation, scale
- Euler angle, rotation matrix, quaternion
- Viewing– camera movement
- Shading and lighting
- Rendering pipelines
- Clipping
- Visibility
- Texture mapping
- Modeling
- Curves and surfaces
- Radiosity, Ray tracing

Schedule

1. Course Overview
Introduction to Computer Graphics
2. Computer Graphics Systems and Model (chap 1)
OpenGL Programming
3. Graphics Programming (chap 2)
OpenGL Geometric Primitives Programming
4. Input and Interaction (chap 3)
OpenGL/GLUT Interaction Programming
5. Geometric Objects (chap 4)
Vector & Matrix (Appendix B&C)
6. Transformation (chap 4)
OpenGL Transformation Programming

Schedule

7. Transformation (chap 4)
OpenGL Orientation Programming
8. [Midterm Exam](#)
9. Viewing (chap 5)
OpenGL Camera Programming
10. Shading (chap 6)
OpenGL Lighting Programming
11. Texture Mapping (chap 8)
OpenGL Texture Mapping Programming
12. Blending (chap 8)
OpenGL Blending Programming

Schedule

13. Modeling (chap 10)
OpenGL Model Loading Programming
14. Line-Drawing & Rasterization (chap 7)
OpenGL Line Drawing Programming
15. [Final Exam](#)

Exams

- Midterm Exam
 - Chapter 1-4
 - 2-hour close-book exam
- Final Exam
 - Chapter 5-10
 - 2-hour close-book exam

Online Resources

- ❑ OpenGL <http://www.opengl.org/>
- ❑ GLUT
<http://www.opengl.org/documentation/specs/glut/spec3/spec3.html>
- ❑ GLUT for win32 <http://www.xmission.com/~nate/glut.html>
- ❑ Lighthouse GLUT <http://www.lighthouse3d.com/opengl/glut/>
- ❑ NeHe <http://nehe.gamedev.net/>
- ❑ MESA3D <http://www.mesa3d.org/>
- ❑ ACM SIGGRAPH <http://www.siggraph.org/>
- ❑ IEEE Visualization <http://vis.computer.org/>

Announcement

- Class blog:
<http://dis.dankook.ac.kr/lectures/cg20/>

