CS6533/CS4533 Interactive Computer Graphics
Fall Semester 2018

Lectures: Thursdays 3:20—5:50pm
Classroom: 2 MTC, Room 9009 (9F)
Course Web site: http://cse.poly.edu/cs653/

Instructor: Professor Yi-Jen Chiang
Office: 2 MTC, 10.050 (10F)
Office Hours: Thursdays 2:00–3:00pm
Phone & Email: (646) 997-3395; chiang@nyu.edu

TA: Xiaoran Ni (Email: xn287@nyu.edu. Office hours: Mondays 3:30–5:30pm in the lab 10.038 (10F) of 2 MTC).

Description: This course introduces the fundamentals of Computer Graphics with hands-on graphics programming experiences. Topics include: graphics software and hardware, 2D line-segment scan conversion, 3D transformations, viewing and projection, programmable shaders, polygon scan-conversion, hidden-surface removal, illumination and shading, compositing, texture mapping, effects of shadow, decal, lattice, fog, firework, etc, ray tracing and radiosity, and so on.

Graphics programming projects will be assigned using the academics and industry graphics standard OpenGL, compiled with the Microsoft Visual C++ under Windows, or on Mac OS or Linux. The first homework is a warm-up exercise to get started with OpenGL programming, and the remaining three homeworks put pieces together to form one course project, which is an animation system with various graphics effects. You will work on the programming homeworks on your own (laptop) computer (it needs to have a programmable GPU to support shader-based OpenGL (OpenGL 3.1 and above), which is usually the case).

Prerequisites: CS 5403 (Data Structures) or equivalents, and knowledge of C/C++ programming.


Grading Distribution: Midterm Exam: 25%, Final Exam: 25%, 4 Programming Assignments (last three put pieces together to form one course project): 50%. (The total score of the 4 Assignments is close to 600 points; the sum of the 4 Assignment scores will be divided by 5 and then multiplied by 50% for the overall score). The full score of the overall score typically exceeds 100 points, and the final grades are based on the distribution of the overall scores of the class.

Midterm and Final Exams: Open Book, Open Notes, In Class. (Note: Only the textbook, your notes, and print-outs of the homeworks and handout sample programs are allowed; all electronic devices, including cell phones and kindles, are NOT allowed.)
General Instructions for Programming Assignments: Submit your write-up, your source code (with full comments and documentation), and include brief instructions on how to compile and run your programs. Submit everything to NYU Classes of this course (if your write-up is hand-written, scan it into a PDF file to submit).

Note: You may discuss the programming assignments with other students currently taking the course, but each write-up and program must be done individually and independently, and you should show that you personally understand everything that you submit.

Sharing code, e.g., copying from others or Internet, allowing others to copy your code, making your code publicly accessible on the web (such as on Github), is Cheating. (See also Policy on Academic Dishonesty below.)

Policy for Late Assignment Submissions: In general, all assignments are due at the beginning of the class. There will be 10% off for each week passed, i.e., the actual score is 90% of the raw score if you are one week late, 80% of the raw score if you are two weeks late, and so on. (But no assignments will be accepted after the date of the Final Exam.)

Tentative Schedule (subject to change):

1 9/6 Motivations, Overview, Graphics Software and Hardware [Lecture Notes]
2 9/13 2D Line-Segment Scan Conversion; OpenGL Standard [Lecture Notes, Ch 1]
   Assgn 1 given
3 9/20 3D Transformations [Ch 2, 3, 4, Appendix B]
4 9/27 3D Transformations [Ch 2, 3, 4, Appendix B];
   Viewing & Projection [Ch 5, Lecture Notes]
5 10/4 Viewing & Projection [Ch 5, 10, 11, 12.1, Lecture Notes];
   Programmable Shaders & Shader-Based OpenGL [Lecture Notes, Ch 1, 6, Appendix A]
   Assgn 1 due; Assgn 2 given
6 10/11 Programmable Shaders & Shader-Based OpenGL [Lecture Notes, Ch 1, 6, Appendix A];
   [Additional Reading: Appendix B, Ch 12, 13]
   Polygon Scan-Conversion [Lecture Notes, Sec 12.4]
7 10/18 Hidden Surface Removal [Lecture Notes, Ch 11]; BSP Trees [Lecture Notes]
8 10/25 Midterm Exam
9 11/1 Illumination and Shading [Lecture Notes, Ch 14]
   Assgn 2 due; Assgn 3 given
10 11/8 Illumination and Shading [Lecture Notes, Ch 14]
11 11/15 Illumination and Shading [Lecture Notes, Ch 14]; Compositing [Lecture Notes]
   Assgn 4 given
12 11/22 NO CLASS (Thanksgiving Recess)
13 11/29 Compositing [Lecture Notes]; Textures [Lecture Notes, Ch 15]. Assgn 3 due
14 12/6 Textures [Lecture Notes, Ch 15]
15 12/13 Ray Tracing and Radiosity [Lecture Notes, Ch 20]
   Assgn 4 due on Tuesday 12/18 (by 5pm)
16 12/20 Final Exam

Policy on Academic Dishonesty:
First time: 0 point for the work; second time: F for the course. see Student Code of Conduct:
Moses Center Statement of Disability
If you are a student with a disability who is requesting accommodations, please contact New York University’s Moses Center for Students with Disabilities at 212-998-4980 or mosescsd@nyu.edu. You must be registered with CSD to receive accommodations. Information about the Moses Center can be found at www.nyu.edu/csd. The Moses Center is located at 726 Broadway on the 2nd and 3rd floors. Please do this at the start of the semester.