MASSACHUSETTS INSTITUTE OF TECHNOLOGY
Department of Electrical Engineering and Computer Science
6.837 — Computer Graphics
Fall Semester, 1997

General Information

Course Overview:

6.837 is a comprehensive first course in 3D computer graphics, for undergraduates with an interest, and reasonable proficiency, in geometric computation. It can be taken for "G" credit by graduate students. Note for EECS students: this course accrues 6 EDPs (Engineering Design Points), not 2 as listed in some catalogs.

The course begins by introducing 2D rendering and coordinate systems, and the classical rendering pipeline. Several topics are then examined in depth: modeling hierarchies, coordinate transformations, clipping, local and semi-local shading operations, and rasterization. Advanced topics, including algorithms for antialiasing, global illumination (ray tracing and radiosity), visible surface identification and morphing are covered, as are modern graphics hardware architectures. General interaction and optimization techniques are also considered. The course concludes with a discussion of career paths in graphics, both industrial and academic. Occasional guest lectures may be given by industry or academic speakers. (The first of these is scheduled for Wednesday, 1 October, from 7-9pm in 34-101.)

Programming assignments are due each Friday from the second through seventh weeks of the course. A substantial team programming project, involving weekly progress meetings with course staff over weeks eight through twelve, culminates in a written report (week thirteen) and oral presentation and demonstration (week fourteen). Limitations on electronic classroom availability will cause some presentations to be scheduled on weekday evenings (from 7-9pm) and during the afternoon of Saturday, December 6^{th}. The course has no exams or final.

Course Lectures:

TR 2:30-4pm, 3-270

Prof. Seth Teller, `seth@graphics.lcs.mit.edu`, NE43-208, 258-7885

Office Hours: T 4-5 and by appointment.

Course Secretary:

Mitch Mitchell, `mitch@lcs.mit.edu`, NE43-209, 253-6837

Course Teaching Assistants:

David Gupta, `gupta@theory.lcs.mit.edu`

Jonathan Levene, `jslevene@graphics.lcs.mit.edu`

Luke Weisman, `luke@graphics.lcs.mit.edu`

Course Text:

Hearn and Baker: *Computer Graphics, C Version,* 2^{nd} *Edition*, at Quantum Books.

Course Page:

`http://graphics.lcs.mit.edu/classes/6.837/F97`

Course Workstations:

There are almost 100 SGI workstations in Athena clusters across campus. The Athena command `cview` should report on cluster locations and machine availability. The command `tellme combo` will report the cluster door combination. Finally, there are 15 Pentium machines available in 38-344 (cluster combination given in class).

Course Resources:

Foley et al: *Introduction to Computer Graphics*
Glassner, Ed.: *Graphics Gems*
Neider et al: *OpenGL Programming Guide*
OpenGL Architecture Review Board: *OpenGL Reference Manual*
OpenInventor Architecture Group: *OpenInventor* C++ *Reference Manual*
Rogers and Adams: *Mathematical Elements of Computer Graphics*
Proceedings of ACM SigGraph, 1980 – present.
All are available at the LCS Reading Room in NE43, first floor.

Course Prerequisites (substitutions allowed):

6.046J (Introduction to Algorithms)
18.06 (Linear Algebra)
Some C, C++, or JAVA language experience.
All students must complete the online registration form at

`http://graphics.lcs.mit.edu/classes/6.837/F97/register.html`

Course grading:

Course grades will be derived from six programming assignments (60%) and a final project (40%). Programming assignments should be completed by individual students, with no collaboration on coding (although discussing the assignment is fine). All assignments are due Fridays at 5pm (as time-stamped by `turnin` or its equivalent). **Absolutely no late work will be accepted**, except if accompanied by a letter from the Dean.

Students must work in teams of three for the final project. Projects must exhibit technical creativity and competence. All projects must be commenced by a written statement of goals, and accompanied by a written report (approximately ten pages) of what was attempted, what was achieved, and what was learned. The team will also present the project to the teaching staff in an Athena electronic classroom.

Course calendar:

A course calendar summarizing all lecture topics, assignment issue and due dates, and project progress meetings and presentation venues, is posted at

`http://graphics.lcs.mit.edu/6.837/F97/calendar/sep.html`

Course Exams:

This course has no exams or final.