CNG 477 Introduction to Computer Graphics

2012-2013 Fall Semester

Syllabus

Course Info

Catalog Description


Credits 3

Category Content Technical Elective

Prerequisites CNG 213

Lecture Time and Place

- Friday 08:40, 09:40, 10:40 [TAZ-11] Tolga Can

Text Book


Reference Books


Instructor

- Tolga Can, TZ-30, tcan@ceng.metu.edu.tr
Course Objectives

CENG 477 Introduction to Computer Graphics introduces the basic concepts of computer graphics and raster based methods. It also provides the necessary theoretical background for introductory computer graphics and demonstrates the application of computer science to graphics. It also offers an opportunity for students to formulate and implement applications of computer graphics. This course further allows students to develop programming skills in computer graphics by programming assignments.

Course Conduct

CNG 140 is an upper level technical elective course for the Computer Engineering undergraduate program. It is an advanced course which requires a lot of linear algebra and mathematics.

The purpose of this course is to teach students the fundamental components of a computer graphics system which generates 2D images from 3D/2D virtual worlds.

The course is structured on the following materials:

1. Text book
2. Lectures
3. Homeworks

- **Homeworks:** There will be 4 Homeworks throughout the semester. The first homework will be a small warm-up homework which will serve the purpose of setting your OpenGL programming environment. All the homeworks will required to be implemented individually and any code sharing will be considered as cheating and you will get a 0 (zero) grade for that homework automatically. Usually you will have 2-3 weeks of time to turn your homeworks in. This time shall be used properly. The level of the homeworks are so that a “hard work on the last 2-3 days” will not suffice. You are strongly advised to start concentrating on the homework right after you received it.

- **Lectures:** Attendance to lectures is mandatory. Attendance will be taken at the beginning of each hour. In order to be eligible to take the final exam, you need to attend 70% of the lecture hours. Otherwise, you will get a grade of NA automatically which will not allow you to take neither the final exam nor the re-sit exam.
Weekly Coverage

- **Week-1**
  - Info on course conduct
  - Introduction to graphics hardware and software
  - Introduction to OpenGL and GLUT

Distribution of Warm-up homework

- **Week-2**
  - Output primitives (DDA, Bresenham's, circle and ellipse generating algorithms)

- **Week-3**
  - Filled area primitives (Scan-line polygon fill, boundary fill, flood fill)

- **Week-4**
  - 2D and 3D geometric transformations (homogenous coord., translation, rotation, scaling, reflection, shear), and transformations between coordinate systems, affine transformations

- **Week-5**
  - Week 4 continued

Distribution of Homework #1

- **Week-6**
  - Two-dimensional viewing (viewing Pipeline, window-to-viewport coordinate transformation, line clipping, polygon clipping)

- **Week-7**
  - Three-dimensional viewing (viewing pipeline, projections, viewing parameters)

- **Week-8**
  - Week 7 continued

Midterm Examination (November 23) (Week 9)

Distribution of Homework #2

- **Week-10**
  - Texture Mapping, Bump Mapping
• **Week-11**
  o Introduction to Object Representations

• **Week-12**
  o Three-dimensional object representations (polygon surfaces, curved line and surfaces, splines, bezier curves and surfaces)

Distribution of Homework #3

• **Week-13**
  o Illumination models, and surface rendering (basic illumination models, polygon rendering methods)

• **Week-14**
  o Visible surface detection (back face, depth buffer, depth sorting)

**Grading Policy**

• Warm-up Assignment 5%
• Attendance 5%
• Programming Assignments 30%
• Midterm 30%
• Final 30%

If you are caught cheating in an exam, you will get a grade of 0 (zero) for that exam. You must attend 70% of the lectures in order to be eligible to take the final exam. Otherwise, you will get a grade of NA from the course.