

# CS 3110 Introduction to Computer Graphics

## 3(3-0-3) 90 hours

### UT – Athabasca University, University of Calgary

Prerequisites: CS 1150 It is preferred that the student also be registered in CS 2010 concurrently if they have not taken it. The student must enjoy mathematics as it is at the core of computer graphics.

Instructor: David Gregg

Office/ Phone: C427/ 539-2976

Office Hours: TBA and by prior arranged appointment.

email: [gregg@gprc.ab.ca](mailto:gregg@gprc.ab.ca)

Required Textbook: Introduction to 3D Game Programming with DIRECTX 9.0c—a Shader Approach by Frank D. Luna

Note: The text is more of a user's manual than a traditional textbook. If you would like to read a more traditional textbook, there are many excellent computer graphics textbooks available for purchase or through the library. Feel free to consult me for further information.

A complete set of overheads are handed out throughout the course. Please realize that they are simply a summary of what is discussed in class and not intended to substitute for your reading of the text and other computer graphics texts.

Course Description: This is an introductory course covering the major topics of computer graphics, geometric modeling, and computer-based animation.

Primary topics will include:

- mathematics review;
- 2D graphics including scan conversion, clipping, 2D homogeneous transformations and 2D animation;
- 3D graphics including 3D homogeneous transformations and projections;
- geometric modeling;
- hidden surface removal;
- light, reflectance, shading models, and shading languages;
- Texturing
- 3D animation;
- computer graphics hardware and device-independent graphics software.

The primary purpose of the first part of the course is develop a solid grounding in the mathematics useful for computer graphics. MATLAB will be used to help with any tedious mathematical calculations. Any programming assignments during the first part of the course will use Java. The second part of the course will use C/C++ and the DirectX 9.0c graphics API running on Windows™ workstations.

Course Format: This course is 3 lecture hours and 3 lab hours per week. When necessary, lab time will be utilized for lecturing on specific Mathematical, Graphics, Java, C/C++, and DirectX concepts and features. The remainder of lab time will generally be used as "hands-on" programming time.

|             |              |     |
|-------------|--------------|-----|
| Evaluation: | Assignments  | 25% |
|             | Quizzes      | 15% |
|             | Midterm Exam | 30% |
|             | Final Exam   | 30% |

Your final grade, calculated as a percentage, is converted to a letter grade as follows:

|          |    |              |
|----------|----|--------------|
| 90 – 100 | A+ |              |
| 85 – 89  | A  |              |
| 80 – 84  | A- |              |
| 76 – 79  | B+ |              |
| 73 – 75  | B  |              |
| 70 – 72  | B- |              |
| 67 – 69  | C+ |              |
| 64 – 66  | C  |              |
| 60 – 63  | C- |              |
| 55 – 59  | D+ |              |
| 50 – 54  | D  | minimal pass |
| 0 – 49   | F  | fail         |

Assignment Policy: Assignments/Projects are to be handed in and/or demonstrated in the scheduled lab on the due-date. Late assignments/projects will be penalized by 50%. Late assignments/projects may not be accepted after the end of classes.

The student can expect approximately 8 assignments, and 3 projects during this course. Assignments can typically be completed within about one week of time, whereas projects may require several weeks time. The first project is a programming assignment based on 2D graphics using Java; the second project is a 3D project using C/C++ and DirectX; the third project is a group research project that is presented to the class during the latter part of the course.

**To pass this course you must achieve an overall course average of 50% on all exams and quizzes.**