Computer Graphics

Course # COMP 4071

Credits 6

Prerequisites and/or Corequisites: Mathematics: Linear algebra, including vectors and matrices. Computer Science: Programming ability in Python or C/C++ and in JavaScript.

Course Description

This course covers the creation of 2D and 3D drawings and animations using JavaScript and WebGL for display on web pages. You will learn how to use the mouse and keyboard to interact with these drawings, for example, to create and modify smooth curves. You will also implement in software some of the basic algorithms that WebGL performs, including line drawing, triangle drawing, and Z-buffer visibility tests.

Course Learning Outcomes

Upon the completion of this course, you will be able to:

- Draw lines and triangles using WebGL.
- Draw lines and triangles with your own software.
- Write GLSL vertex and fragment programs for different sorts of shading and highlights.
- Produce animated displays that change and move.
- Interact with these displays using the mouse or touchpad.
- Design smooth curves using multiple cubic Bezier curve segments.
- Use hierarchical modeling to move segmented skeletons of characters or robots.
- Use JavaScript and WebGL to create interactive and/or animated web pages.

Course Assessments and Grading

Item	**Weight**
Homework assignments	10 %
Quizzes / In-class exercises	10 %
Midterm exam	20 %
Group Project	20 %
Final exam	40 %