CS 543 Computer Graphics

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**Course Content**

This course provides a study of computer graphics representation schemes and rendering algorithms such as advanced methods for representing, displaying, and rendering two- and three-dimensional scenes, general algebraic curves and surfaces, splines, Gaussian and bump-function representations, fractals, particle systems, constructive solid geometry methods, lighting models, radiosity, advanced ray-tracing methods, surface texturing, animation techniques data visualization methods.

In the second part of the course, we will cover data visualization basics and how to create interactive visual analytics tools.

**Objectives**

The objective of this course is to understand the workings of computer-generated images, animations, and visualizations. The students will master the basics of computer graphics in theory and practice.

**Recommended or required reading**

Reading material will be distributed.

**Course Policies**

Plagiarism: There is **no teamwork** encouraged in this course. You are expected to research and develop course projects alone. You can use some allowed resources but before using them you must contact the course instructor or assistants to make sure that you are not crossing the line. **This is very important.**

Plagiarism and academic integrity are very important issues. You only have your reputation in the academic world. And it takes only one mistake and it is forever lost. As long as you are a student the rule is simple: be honest and open to your Professor/Adviser. Explain him all the sources you used and how you used. If you are doing something you will get embarrassed explaining to me, you are doing something wrong. ***Any plagiarism will lead to grade F without any exceptions*.**

Project: There will be two short projects and one term project:

3D Project. Implemented on OpenGL with C++. The project requirements will be distributed separately.

Data Visualization Project. Implemented with Python and/or Javascript. The project requirements will be distributed separately.

Term Project: Select one paper from one of the following resources, discuss with the class and implement, if possible, improve it.

Resources: ACM Transactions on Graphics, IEEE Transactions on Computer Graphics and Visualization Journals, The Computer Graphics Forum and related conferences (SIGGRAPH, IEEE Vis and Eurographics / EuroVis) for ideas. The future work section of papers are full of ideas.

Grading

3D Project              20%

Visualization Project 20%

Term Project             60%

Participation is expected and highly rewarded…