# CSED451 Computer Graphics Syllabus

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## 1. Textbooks

- Course Lecture Notes
- E. Angel and D. Shreiner, Interactive Computer Graphics: A Top-Down Approach with Shader-Based OpenGL, 6th ed., Addison-Wesley, 2011. (http://www.cs.unm.edu/~angel/BOOK/INTERACTIVE_COMPUTER_GRAPHICS/SIXTH_EDITION/)

## 2. References

- Hearn, Baker, Carithers, Computer Graphics with OpenGL, 4th ed., Pearson, 2010.
- Any good materials on OpenGL and shader programming

## 3. Topics

- Graphics basics (12 units)
  - ✧ Introduction (chap 1)
  - ✧ OpenGL programming (chap 2)
  - ✧ Transformations (chap 3)
  - ✧ Viewing (chap 4)
  - ✧ Programmable shaders (chap 2)
  - ✧ Hierarchical modeling (chap 8)
- Modeling (1)
  - ✧ Polygonal meshes
- Rendering (5)
  - ✧ Rendering concepts
  - ✧ Hidden surface removal (chap 4.8)
  - ✧ Illumination and shading (chap 5)
  - ✧ Texture mapping (chap 7)
- Clipping & Rasterization (2) (chap 6)
- Curves & surfaces (2) (chap 10)
- Animation (1)
  - ✧ Key-frame animation
- Advanced rendering (1)
  - ✧ Ray tracing & Radiosity (chap 11)
- Review
- Advanced topics (self-study)
  - ✧ Multi-resolution meshes
  - ✧ Subdivision meshes
  - ✧ Non-photorealistic rendering

4. **Requirements**
   - Students should be familiar with the basic concepts of linear algebra.
   - Students should be familiar with computer programming to successfully manage programming assignments.
   - Students don't have to be familiar with graphics programming.

5. **Grading**
   - Midterm exam: 25%
   - Final exam: 25%
   - Programming assignments: 30%
   - Term project: 20%

6. **Course Schedule**
   - Shared spreadsheet
   - The sheet will be regularly updated with the lecture progress.

7. **Other Information**
   - Lecture notes and programming assignments will be available at the LMS system.
   - There will be four programming assignments. Students are required to compose two-member teams for the programming assignments. Programming assignments should be developed using OpenGL and GLSL.
   - For term projects, students are required to compose three-member teams. There are no constraints on the topic and development environment for a term project, if the topic is related to graphics.
   - Course inquiries can be emailed to the instructor or TA, or preferably posted on the LMS board.
   - The final grade will take the class attendance into account.
   - For students with S/U grades, the final grades will be U if their letter grades are below B0.