

## CS 450 – Introduction to Computer Graphics

**Catalog Description:** 2-D and 3-D graphics APIs. Modeling transformations. Viewing specification and transformations. Projections. Shading. Texture mapping. Traditional animation concepts. 3-D production pipeline. Keyframing and kinematics. Procedural animation.

**Credits:** 4                    **Terms Offered:** Fall

**Prerequisites:** MTH 254 or MTH 254H

**Courses that require this as a prerequisite:** None

**Structure:** Three 50-minute lectures per week

**Instructors:** Ronald Metoyer

### Course Content:

- Graphics pipeline
- Scan conversion
- 2D transformations
- 3D transformations
- Perspective projections (orthographic)
- Visible surface determination
- Illumination, shading, and shadows
- Ray tracing
- Texture mapping
- Anti-aliasing

### Measurable Student Learning Outcomes:

At the completion of the course, students will be able to...

1. **Describe** the names and functions of the elements of the graphics pipeline (Level 1; ABET Outcomes: A)
2. **Use** 4x4 matrices to create and apply single and multiple transformations to 3D points (Level 3; ABET Outcomes: A)
3. **Create** a program using the OpenGL Graphics API (Level 3; ABET Outcomes: A, B, C, I)
4. **Design** a mouse-driven user interface for 3D applications (Level 3; ABET Outcomes: A, C, j)
5. **Describe** various visible surface determination algorithms (Level 1; ABET Outcomes: A, B, j)
6. **Use** OpenGL to model the interplay between a light source and a surface (Level 3; ABET Outcomes: A, B, C, i)
7. **Describe** the animation production pipeline (Level 1; ABET Outcomes: A)
8. **Produce** a short animation (Level 3; ABET Outcomes: A, B, C, J)

### Learning Resources:

- *Computer Graphics: Principles and Practice*, by Foley, van Dam, Feiner, and Hughes (required)

**Students with Disabilities:**

Accommodations are collaborative efforts between students, faculty and Services for Students with Disabilities (SSD). Students with accommodations approved through SSD are responsible for contacting the faculty member in charge of the course prior to or during the first week of the term to discuss accommodations. Students who believe they are eligible for accommodations but who have not yet obtained approval through SSD should contact SSD immediately at 737-4098.

**Link to Statement of Expectations for Student Conduct:**

<http://oregonstate.edu/admin/stucon/achon.htm>

Revised: 8/15/07