

# ASU Computer Science and Engineering Department

## CSE 470 – Computer Graphics Syllabus – Fall 2014

### *Instructor and Office Hours:*

**Instructor:** Ross Maciejewski

**Office:** Brickyard 344 (3<sup>rd</sup> floor)

**Phone:** 480-965-2785

**Email:** [rmacieje@asu.edu](mailto:rmacieje@asu.edu)

**Office Hours:** T 2:30PM – 4:00PM

If these hours are not convenient, I will be happy to make an appointment to meet.

*Teaching Assistant:* Wen Zhang

### **Catalog Description:**

Introduces basic concepts of interactive computer graphics, realistic rendering, and 3-D viewing.

### **Course Objectives and Outcomes:**

This course is designed to provide a comprehensive introduction to computer graphics. Course outcomes include:

- Understanding of the **design issues** for creating graphics
- Ability to apply rendering techniques to an **actual computer graphics problem** and associated datasets
  - Basic knowledge of OpenGL
- Understanding of the **mathematical foundations** of graphics
  - Object representations
  - Transformations
  - Projections
- Understanding of **color, illumination, and shading**
- Understanding of **rendering** and **rasterization** techniques
  - Raytracing
  - Polygonal rendering
- Understanding of some **applications** of computer graphics
  - Visualization, animation, computer aided design, Virtual Reality, computer games, etc

### **Prerequisites:**

Computer Systems Engineering BSE or Computer Science BS students; CSE 310 with C or better; MAT 342 or 343

### **Textbook:**

OpenGL Programming Guide 8<sup>th</sup> Edition (Recommend, not required)

**Grading:** The grading schema is broken down as follows

Item	Number of Items	Percent of Final Grade
Programming Assignments	4-8	55%
Midterm Exam	1	20%
Final Exam	1	25%

**Assignments:**

This class is meant to be a program-intensive class, with programs every one to three weeks depending on various factors. Programs will be used to test your knowledge of computer graphics and you will be creating interactive programs that focus on 2D and 3D rendering, lighting and shading. Program assignments in Computer Graphics are likely larger than any other undergraduate programming assignment you have previously had. You are expected to start early and use the allotted time wisely.

**NO LATE ASSIGNMENTS WILL BE ACCEPTED! NO EXTENSIONS WILL BE GIVEN!**

**Attendance:**

Attending class is important in order for you to be aware of what is going on. Often, announcements will be made or information will be discussed that is not available on blackboard. Your attendance grade will be determined by in-class quizzes. Quizzes are used to help give students guidance on the types of questions they can expect on their exams. Answers will be discussed in class, and the quiz will only be used to measure participation.

**Grade Breakdown:**

A+	<b><math>\geq 97\%</math></b>
A	<b><math>\geq 93\%</math> and <math>&lt; 97\%</math></b>
A-	<b><math>\geq 93\%</math> and <math>&lt; 97\%</math></b>
B+	<b><math>\geq 87\%</math> and <math>&lt; 90\%</math></b>
B	<b><math>\geq 83\%</math> and <math>&lt; 87\%</math></b>
B-	<b><math>\geq 80\%</math> and <math>&lt; 83\%</math></b>
C+	<b><math>\geq 77\%</math> and <math>&lt; 80\%</math></b>
C	<b><math>\geq 73\%</math> and <math>&lt; 77\%</math></b>
C-	<b><math>\geq 70\%</math> and <math>&lt; 73\%</math></b>
D	<b><math>\geq 60\%</math> and <math>&lt; 70\%</math></b>
E	<b><math>&lt; 60\%</math></b>

While a curve may be applied in class (unlikely) I will not know or announce this until the end of class. If you have a concern as to your current status passing the class, refer to the grade breakdown above. I reserve the right to lower cutoffs.

**Schedule:**

<b>Week</b>	<b>Tuesday</b>	<b>Thursday</b>
8/18 – 8/22		Syllabus What is Computer Graphics
8/25 – 8/29	Image Formation Linear Algebra	Linear Algebra OpenGL
9/1 – 9/5	Geometry and Representations	Transformations OpenGL Transformations
9/8 – 9/12	Local Coordinate Systems Mouse and Keyboard Input	Classic Viewing Computer Viewing
9/15 – 9/19	Meshes	Projection Matrix Buffers
9/22 – 9/26	Texture Mapping	Procedural Textures
9/29 – 10/3	Shading	GL Shading Language
10/6 – 10/10	Midterm Review	Midterm
10/13 – 10/17	<b>Fall Break No Class!</b>	Hierarchical Modeling
10/20 – 10/24	Graphics and Gaming	Scene Graphs Particle Systems
10/27 – 10/31	Shadows	Under the Hood – OpenGL Implementation
11/3 – 11/7	Shadows	Illumination Models
11/10 – 11/14	<b>Veterans Day Holiday (?) No Class (TBD)</b>	Ray Tracing
11/17 – 11/21	Ray Tracing	Ray Tracing
11/24 – 11/28	TBD	<b>Thanksgiving Holiday No Class</b>
12/1 – 12/5	TBD	Final Exam Review

**Course Policies:**

**Laptops in class:** Students are only permitted to have laptops open in the classroom for taking notes. Any infraction will result in your laptop privileges being revoked. Cell phones are not allowed out in class.

**Incomplete Grades:** A course grade of “Incomplete” will be given only in extreme situations because the sad story is that most students who request incompletes never finish the course.

Please visit <http://www.asu.edu/registrar/forms/regforms.html> under the Academic Record Forms section for the Incomplete Grade Request form, which is available in both Word and as a PDF. The form must be completed by the student, signed by the student, the instructor, and the department chair or school director. The completed form must be filed with Janice Frangella (Bell Hall, Room J7 before the grade of "I" is given.

**Student Conduct:** Students are required to adhere to the behavior standards listed in Arizona Board of Regents Policy Manual Chapter V – Campus and Student Affairs Part C: Code of Conduct ([http://www.abor.asu.edu/1\\_the\\_regents/policymanual/chap5/](http://www.abor.asu.edu/1_the_regents/policymanual/chap5/)) and ACD 125: Computer, Internet, and Electronic Communications (<http://www.asu.edu/aad/manuals/acd/acd125.html>). Students are entitled to receive instruction free from interference by other members of the class. If a student is disruptive, an instructor may ask the student to stop the disruptive behavior and warn the student that such disruptive behavior can result in withdrawal from the course. An instructor may withdraw a student from a course when the student's behavior disrupts the educational process under USI 201-10 <http://www.asu.edu/aad/manuals/usi/usi201-10.html>.

***Accommodations for Disabilities:*** The Americans with Disabilities Act (ADA) is a federal antidiscrimination statute that provides comprehensive civil rights protection for persons with disabilities. One element of this legislation requires that all qualified students with documented disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring an accommodation please contact the Disability Resource Center at ASU Polytechnic located in Student Affairs Quad # 4 or call 480-727-1039 / TTY: 480-727-1009. Eligibility and documentation policies online: <http://www.asu.edu/studentaffairs/ed/drc/>

## **Academic Integrity**

The highest standards of academic integrity are expected of all students. The failure of any student to meet these standards may result in suspension or expulsion from the university. Violations of academic integrity include, but are not limited to, cheating, fabrication, tampering and plagiarism. Signing an attendance sheet for another student is also considered a violation of academic integrity.

See: ASU Student Academic Integrity Policy [http://www.asu.edu/studentaffairs/studentlife/judicial/academic\\_integrity.htm](http://www.asu.edu/studentaffairs/studentlife/judicial/academic_integrity.htm)

### **Sanctions** <http://provost.asu.edu/academicintegrity/policy/Sanctions>

An instructor, academic supervisor, or committee responsible for evaluation may impose any of the following sanctions for academic dishonesty:

- Reduced or failing grade for assignment,
- Reduced or failing grade for course, or
- Reduced, failing grade, or no credit for other academic evaluation (e.g., clinical training, comprehensive exam, thesis, dissertation).
- Within 10 days after an instructor-imposed sanction is assigned, the student may appeal the sanction to the Dean or Director.

Additionally, an instructor, academic supervisor, or committee responsible for academic evaluation may recommend other or additional sanctions to the Dean or Director, including assignment of the grade of XE and withdrawal of credit for a previously accepted course or requirement.

## **Emergency and Safety Procedures**

When a fire alarm sounds, take what you can easily carry (cell phone, backpack, purse, etc) and exit the building. Stay with the instructor who will provide instructions on where to remain standing once outside of the building. To promote classroom safety, please notify the instructor of any suspicious behavior or statements regarding any ASU class or event at any time during the semester. Become familiar with all of the exit routes in the classroom and building and in the event of a classroom emergency, evaluate the situation for your safest and quickest escape from harm's way. Once out of danger call 911. The ASU Police non-emergency number is: 480.965.3456