SER 332
Introduction to Graphics and Game Development
`http://javiergs.com/teaching/ser332/`
Spring 2018

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1. Description

SER 332 is a beginner level course for students interested in learning foundations of graphics used in modern rendering and basic principles of the game development pipeline. It includes graphics and math concepts which are applied in fields such as games, graphics, and visualization. This class will teach you about the basic principles of 3D computer graphics: meshes, transforms, cameras, materials, lighting, and animation. The programming language used in the course is C/C++ and the graphics API used is OpenGL.

Strong programming skills are needed to be able to complete the assignments and projects in this course.

2. Credits and contact hours

3 credits, lecture/lab

3. Student learning outcomes

Students completing SER 332 will be able to:

- Understand how to use a graphics API
- Understand basic graphics math
- Understand meshes and be able to render/draw their geometry
- Understand texturing, color and lighting of meshes
- Understand the basics of a programmable graphics pipeline and demonstrate the ability to write shaders

4. Prerequisites or co-requisites.

- SER 200 – Core Data Structures with Object Oriented Programming.

5. Topics

- Linear Algebra
- Programming with C/C++ and OpenGL
- Transformations
- Mesh
- Animation
- Lighting

6. Course resources

- Tomas Akenine-Moller and Eric Haines. Real-Time Rendering (3rd Edition). AK Peters, Ltd.
- D. Hearn and M. P. Baker. Computer Graphics with OpenGL (3rd Edition). Prentice Hall.
- J. Neider, T. Davis, M. Woo, The OpenGL Programming Guide, Addison-Wesley

7. Evaluation

Four projects are the core of the course. They must be submitted using the online submission site (assignments submitted over e-mail will not be accepted).

Project 1:	10%
Project 2:	10%
Project 3:	10%
Project 4:	10%
Midterm:	25%
Final exam:	25%
Assigned readings (assessed by pre-class quizzes and/or discussion participation)	10%

Assignments, quizzes, and projects **can never be made up and can never be turned in late**.

Grading Appeals: Any discrepancy or disagreement in grading must be presented to the instructor within a week of your receipt of your graded materials; otherwise no grade change will be made.

Note: I reserve the right to change this grading system as the course progresses and various circumstances develop.

8. Grading

The following is the grading scale that will be used in the course (I reserve the right to modify the scale or grading system). Any adjustments to grading must be presented within two days of receipt of your graded materials – no grade changes will be made afterwards.

- A+ >=   97%
- A   >=   93%
- A- >=   89%
- B+ >=   85%
- B   >=   81%
- B- >=   77%
- C+ >=   73%
- C   >=   69%
- D   >=   65%
- E   <   65%

The grade of "I" (incomplete) can be given ONLY when a student, who is doing otherwise acceptable work (passing grade), is unable to complete a part of work (e.g., the final exam) because of documented illness or other conditions beyond the student's control. In the latter case, the student must discuss with the instructor and complete an application form from the department before the part of work is due or as soon as the circumstances are known. Please see ASU grading policies at: https://students.asu.edu/grades

9. Classroom Behavior

Cell phones and pagers (must be/or state alternative rule) turned off during class to avoid causing distractions. **The use of recording devices is not permitted during class**. Any violent or threatening conduct by an ASU student in this class will be reported to the ASU Police Department and the Office of the Dean of Students

10. Disability Accommodations.

Suitable accommodations will be made for students having disabilities and students should notify the instructor as early as possible if they will require same. Such students must be registered with the Disability Resource Center and provide documentation to that effect.

11. Academic Integrity and Honor Code

You are encouraged to cooperate in study group on learning the course materials. However, you may not cooperate on preparing the individual assignments. Anything that you turn in must be your own work: You must write up your own solution with your own understanding. If you use an idea that is found in a book or from other sources, or that was developed by someone else or jointly with some group, make sure you acknowledge the source and/or the names of the persons

in the write-up for each problem. When you help your peers, you should never show your work to them. All assignment questions must be asked in the course discussion board. Asking assignment questions or making your assignment available in the public websites before the assignment due will be considered cheating. All individual tests must be done independently. Working together during tests is not permitted.

The instructor and the TA will CAREFULLY check any possible proliferation or plagiarism by comparing among the student submissions, previous student submissions, and the publications in the public Web sites. We will use the document/program comparison tools like MOSS (Measure of Software Similarity: http://moss.stanford.edu/) to check all assignments and tests that you submitted for grading.

The Ira A. Fulton Schools of Engineering expect all students to adhere to ASU's policy on Academic Dishonesty. These policies can be found in the Code of Student Conduct:

https://provost.asu.edu/academic-integrity

ALL cases of cheating or plagiarism will be handed to the Dean's office. Penalties include a failing grade in the class, a note on your official transcript that shows you were punished for cheating, suspension, expulsion and revocation of already awarded degrees.

Fulton Schools of Engineering Honor Code

https://engineering.asu.edu/integrity/

1. Seek out, acquaint myself with, and obey the instructor's rules concerning the materials I am allowed to use and the types of collaboration in which I am permitted to engage in each of my courses.

2. Help my fellow engineering students to succeed both academically and professionally, while both following the instructor's guidelines on collaboration and encouraging my classmates to behave ethically.
3. Ensure that all of my individual work products reflect my own abilities and not those of someone else. I will never copy the work of others or give others the opportunity to copy mine.

4. Contribute a fair share of work to all teamwork in which I participate, and acknowledge the contributions of others. I will accept responsibility for the integrity of all work submitted by my team.

5. Use only aids authorized by the instructor during all examinations, quizzes, projects, assignments and other evaluations.

6. Provide aid to, or receive aid from other students only as permitted by the instructor.

7. Give full credit to others for their words and ideas, whether directly quoted or paraphrased, using proper citation practices in all of my work, including text, figures and computer code, and all materials obtained from the Internet.

8. Never act dishonestly including lying, cheating, stealing, or attempting to corrupt the academic enterprise in any way.

9. Ensure that all data I record or report are objective, true, accurate and properly documented.

10. Treat all students, faculty and staff with respect, courtesy and dignity, the way I would like to be treated myself.

11. Recognize that it is how I act when no one else is watching that defines my true character.

12. Act at all times with integrity, as the true professional that I am to become.

12. Sexual Discrimination

Title IX is a federal law that provides that no person be excluded on the basis of sex from participation in, be denied benefits of, or be subjected to discrimination under any education program or activity. Both Title IX and university policy make clear that sexual violence and harassment based on sex is prohibited. An individual who believes they have been subjected to sexual violence or harassed on the basis of sex can seek support, including counseling and academic support, from the university. If you or someone you know has been harassed on the basis of sex or sexually assaulted, you can find information and resources at https://sexualviolenceprevention.asu.edu/faqs

As a mandated reporter, I am obligated to report any information I become aware of regarding alleged acts of sexual discrimination, including sexual violence and dating violence. ASU Counseling Services, https://eoss.asu.edu/counseling, is available if you wish discuss any concerns confidentially and privately.

IMPORTANT

- Any information in this syllabus (other than grading and absence policies) may be subject to change with reasonable advance notice.

- All contents of these lectures, including written materials distributed to the class, are under copyright protection. Notes based on these materials may not be sold or commercialized without the express permission of the instructor. [ACD 304-06].