

Section 01: MW 12:00 – 2:05pm in ATC204

Section 02: MW 9:00 – 11:05am in ATC204

Section 03: MW 3:00 – 5:05pm in ATC204

Instructor: Jason Witherell

Instructor email: jwitherell@shawnee.edu

Instructor phone: 740-351-3113

Instructor office: ATC325 M-R 8:15-9am and R 3 – 4pm, or by appointment



Catalog Description

Introduces students to concepts of 3D graphics, 3D modeling, and the mathematics necessary for 3D programming. Topics include 3D model generation and texture generation, 3D trigonometric operations, 3D vector motion, and matrix transformations in 3-space. Lab activities focus on creating textures and models and learning the mathematical principles that underlie the computer graphics field.

Textbook / Other Resources (recommended, but not required) *let me know if you know of other good resources...*

- 3D Math
 - **3D Math Primer for Graphics and Game Development, 2nd ed.** (Dunn & Parberry) 978-1-56881-723-1
 - **Khan Academy** (the 3d vector and matrix lectures are especially good)
 - <http://chortle.ccsu.edu/vectorlessons/vectorindex.html>
 - ...
- Python
 - <https://www.tutorialspoint.com/python/>
 - https://en.wikibooks.org/wiki/A_Beginner's_Python_Tutorial
 - ...

Student Learning Outcomes. By the end of this course, students will be able to...

- *Understand* and *apply* vector-based terminology and algorithms
- *Understand* and *apply* matrix-based terminology and algorithms
- *Implement* a simple vector-based raytracer
- *Implement* a simple matrix-based rasterizer
- *Convert* a mathematical description of a scene to a 2d image using common graphics algorithms
- *Become* intermediate-level Python programmers
- Be able to *create* simple meshes (textured and animated) in a 3d modelling package.

Grading Policies

In this course, your grade will be based on labs and quizzes using the following weighting scheme:

- 45%: Programming Projects
- 8%: 3D Modelling Projects
- 32%: Quizzes
- 15%: Comprehensive final exam

Programming Projects

In Python (and pygame to some extent). Many students see this is the only component of the class. I encourage you to think of these as a place to practice the math concepts we discuss in class and as preparation for the quizzes (which are often difficult).

3D Modelling Projects

In Blender3D. I'm not trying to make you expert artists / modelers. I just want to expose you to how the "other half" works, and to give you the skills necessary to make placeholder art for later courses. These will usually be short-ish in-class tutorials (and should generally be some easy points).

Paired Programming

Initially, you may partner with one student (in the same section) to pair-program with [ask Jason for an explanation]. The instructor has the right to terminate this on an individual basis or a class-wide basis if it becomes apparent that it's not effective. If doing paired programming, only one student should submit the lab (indicate on the submission who you paired with)

Quizzes

Quizzes are usually announced at least one class period in advance and focus on the material in the section just completed. They will usually (but not always) be given after the lab is submitted. Quizzes are closed-notes, closed-book, and closed-computer unless otherwise specified.

Attendance

Attendance will be taken. It doesn't directly affect your grade, but in the case of a border-line grade (e.g. a 83.5% overall), good attendance might bump your final grade up a bit (in this case from a B- to a B). Good attendance and participation, though, are strongly tied to grade in the class.

Grading Scale

0-60	60-64	64-67	67-70	70-74	74-77	77-80	80-84	84-87	87-90	90-94	94+
F	D-	D	D+	C-	C	C+	B-	B	B+	A-	A

Academic Honesty

If your code looks similar to another student (and you weren't paired programming), it is considered to be plagiarism. The easy way to avoid this is to never look at another student's code or ask them what they typed. It's OK (and encouraged) to discuss class concepts and to work through code examples un-related to the lab, but don't share code!

- First Offence: Warning to all parties (usually on your lab evaluation)
- Second Offence: Everyone involved gets a 0
- Last Offence: Dean of Students and Academic misconduct hearing.

Anticipated Course Topics (and textbook chapters, if you get it)

#	Topic	Length	Book Section	Blender
1	OOP Review + Advanced OOP + Vector Intro	1 week	-	Interface
2	Vector operations + Simple Physics	1.5 weeks		Vertex Modelling
3	Dot and Cross Product	1.5 weeks		Simple Materials
4	3D Spaces (especially camera), Ray-tracer intro	1.5 weeks		Modifiers
5	Geometric Primitives and Ray-collisions	2 weeks		Texturing
6	Solid-color Ray-tracer	1 week		Animation
7	Lighting and Shadows	1.5 week		Rendering
8	Matrices	1 week		Video Editing
9	Transformations	1.5 weeks		Game Engine
10	Rasterization Pipeline	1.5 weeks		TBD
	(1 week for catch-up, snow-days, etc.)			

Semester Schedule

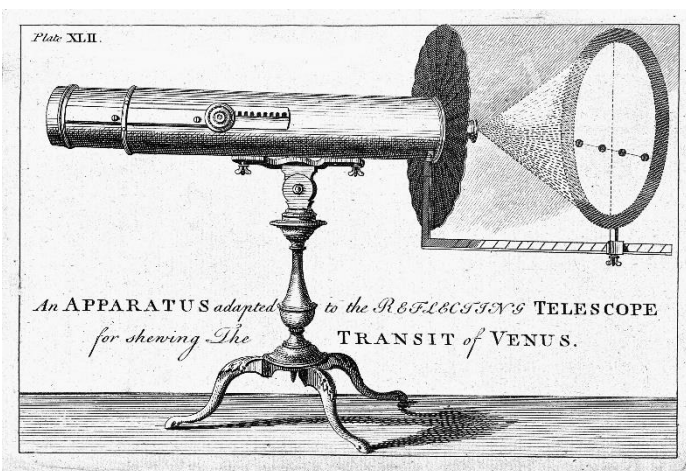
- [M] January 9, 2017: Classes begin
- [M] January 13, 2017: Last day to add a class
- [M] January 16, 2017: **Martin Luther King Jr Day** (NO CLASS)
- [F-Su] January 20 – 22, 2017: **Global Game Jam** (Bonus points!)
- [Su] January 29, 2017: Last day to drop for 90% refund
- [M – F+] February 13 – 24: Student Progress Reporting
- [Sa] February 25, 2017: Student Progress Report available on MySSU
- [M – F] February 27, 2017 – March 3, 2017: **GDC** (Bonus points)
- [M – Su] March 6 – 12, 2017: **Spring Break** (NO CLASS)
- [W] March 22, 2017: **Last day to drop** an individual class on MySSU
- [M – W] April 3 – 6, 2017: Priority **Registration** for Summer / Fall Semester
- [T – R] April 18 – 20, 2017: **East Coast Gaming Conference (ECGC)** (Bonus points!)
- [F] April 28, 2017: Last day of classes
- [Sa – F] April 29, 2017 – May 5, 2017: Final Exams
 - **ETGG1803.01 exam is [M] May 1, 2017 12:00 – 1:50pm**
 - **ETGG1803.02 exam is [W] May 3, 2017 8:00 – 9:50am**
 - **ETGG1803.03 exam is [W] May 3, 2017 2:00 – 4:50pm**
- [Sa] May 6, 2016: Spring Commencement
- [T] May 9, 2017: Grades due by noon
- [W] May 10, 2017: Grades available on MySSU

ADA Statement

Any student who believes s/he may need an accommodation based on the impact of a documented disability should first contact a Coordinator in the Office of Disability Services, Student Success Center, Massie Hall, 740-351-3276 to schedule a meeting to identify potential reasonable accommodation(s). Students are strongly encouraged to initiate the accommodation process in the early part of the semester or as soon as the need is recognized. After meeting with the Coordinator, students are then required to meet with their instructors to discuss the student's specific needs related to their disability. If a student does not make a timely request for disability accommodations and/or fails to meet with the Coordinator of Disability Services and the instructor, a reasonable accommodation might not be able to be provided.

Resources if you need help

- **Jason!** (I'm most helpful if you ask questions during class, a little less-so in office hours)
- The class **SI** (I'll announce the SI and his / her times, assuming we're able to get one)
- Individual **tutors** (available through the Success Center)
- **Lindsay Monihen** (MAS 132), CPS Advisor: academic crises, financial aid questions, transferring, etc.
- **Accessibility Services** (Success Center): disability issues / accommodations.
- **Dean of Students Office** (UC 222): resolution of academic and non-academic resources.
- Student **Ombudsperson**, Linda Hunt (ADM 140): help with appeals, complaints



"Go down deep enough into anything and you will find mathematics."

~Dean Schlicter