

Fall 2019

# IT 485-009: Vulkan Game Programming

D.J. Kehoe

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# Vulkan Game Programming

## Fall 2019 Syllabus

Instructor : DJ Kehoe

Course : IT-485-009

Email: kehoed@njit.edu

Office: IT MIXR Labs

Office Hours: W: 12:00 - 2:00, R 1:00 - 2:00

## Academic Integrity

The NJIT Honor Code will be upheld at all times. The work you do and submit is expected to be the result of your effort only. You may discuss the high level (general) solution of a design problem, however, cooperation should not result in one or more student having possession of copied graphics, code, or any other project element created by another student. Any violations of the NJIT Honor code will be brought to the immediate attention of the Dean of Students.

Objective

## Grading

- Project Design Document: 10%
- Midterm Exam: 15%
- Midterm Project Milestone: 20%
- Weekly Scrum Journal: 10%
- Final Exam: 15%
- Final Project: 30%

Any projects that are submitted late will have a penalty of 1 percentage point per day late. No exceptions. Late projects can only be accepted within the time frame of the course.

## Course Materials

- Canvas Access
- A Github Account [www.github.com](https://github.com)
- <https://github.com/engineerOfLies/gf3d> - The seed project for this course
- GIT-Bash (for windows, or just use linux)
- Visual Studio or GCC
- <https://vulkan-tutorial.com/>
- SDL [www.libsdl.org](https://www.libsdl.org)
- Updated Drivers with Vulkan Support (does not need to be top of the line, most cards should be supported, but will not have all features available)

## Submission Criteria

All projects for the class must follow a set of submission guidelines to be eligible for grading. All projects must include the following:

All Projects must be pre-approved with the professor or they will **not** be graded. A project proposal must be one to two page paper submitted to through canvas. After submission a 1-on-1 meeting will be scheduled to discuss your project's specific deliverables. Grading of the project will be based on the amount of completed deliverables. Deliverables will be a combination of your project specific deliverables as well as common deliverables that will be posted to canvas

All programming projects are to be submitted through [www.github.org](http://www.github.org). To submit a project, post a link to the project repository along with the name of the branch you wish to have graded to your moodle project thread on canvas.

You are required to present your projects in class as part of the project deliverables for grading. These presentations are not formal presentations, merely demonstrations of requirements. Do not prepare slides.

## Course Topics

Week	Topic	Due	Checkpoint
1	Course Overview Course Materials Introduction to Vulkan Programming Practices (Scrum / Commenting) 3D Rendering Concepts Review		Re-image your work machine, its past due
2	Compiling the Seed Project The Vulkan Overview 3D Game Engine Architecture		Demonstrate Project Compiles and runs
3	Swap Chains, Command Buffers, Pipelines, Descriptor Sets & Queues Resource Managers Entity Systems	Design Document Due/ 1 on 1 meetings begin	Able to make visual changes
4	3D Model Processing Shader Programming (GLSL) 3D Collision Detection		Functioning Entity System Collisions Detected
5	Additional Pipelines Event Driven Design Callbacks User Interface Programming	Scrum Journal Checkpoint	Rudimentary HUD Basic Gameplay Features
6	Lighting & Animation		Player Interacting

			with world
7	Midterm Exam Midterm Project Presentations	Midterm Project Scrum Journal Checkpoint	Entities interacting with Player
8	Midterm Project Presentations (Continued)		
9	Loading from Configuration (JSON, GLTF) Building your own Tools		
10	Common 3D Data Structures and Algorithms		
11	Research & Development Processes	Scrum Journal Checkpoint	
12	Lab Work		
13	Lab Work		
14	Final Project Presentations	Final Exam Scrum Journal Due Final Projects Due	

Syllabus subject to change, attend class to keep up to date.