

Syllabus

SPECIAL TOPICS IN COMPUTER SCIENCE

Instructor: Ivan Safrin

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Student Name: Kenan Millet (and possibly Marcus Williams)

DESCRIPTION (From Albert Catalog)

This variable-credit special topics course is for juniors and seniors.

STUDENT SPECIFIC

Project Description:

FPGA's are beginning to be built into computer chips as a means of increasing the speed of programs that run on personal computers. Programs that wish to take advantage of this new technology must be designed with parallel programming in mind. The goal of this course is to design a rudimentary game engine on an FPGA.

Technical Goal:

The technical goal is to use FPGA programming languages (likely SystemVerilog) to develop various modules for creating a videogame.

Theoretical Goal:

The modules designed in the FPGA should be developed in such a way that they could be reapplied, with little modification, to other videogames.

ORGANIZATION

This is an independent study course in which the student will design a semester long project that will be created with the oversight of the assisting professor and the CS advisor. The student will work on the project and will meet / communicate with the professor semi-regularly (at least once every other week) throughout the semester for progress reviews and help.

STUDENT CREATED COURSE OBJECTIVES

1. To learn the underlying structure and components of a videogame engine.
2. To learn how to develop a videogame in an FPGA, while taking advantage of the parallelism.
3. To develop an understanding of how to make larger scale programs in an FPGA.
4. To learn about what features in a videogame engine can run in parallel, and how to do so.

COURSE TOPICS

1. FPGA Programming (SystemVerilog or VHDL)
2. Video Game Engine Design
3. The testing of programmed hardware using an FPGA development board

GRADING PLAN (Total of 100%)

Attendance rate	15%
Intermediate Projects (3 small videogames)	20%
5 page research essay	25%
Final Project	40%

TENTATIVE SCHEDULE (Topics / Meeting dates)

Initial Meeting	First Day
Finished setting up dev environment	Week 1
Completed First Game – Pong	Week 3
Completed Second Game – Space Invaders	Week 5
Completed Third Game – Platformer	Week 7
Begin Final Project – Simple Game Engine	Week 9
Research Essay	Week 12
Final Review of Project and Essay	Last Day