ENGR 19/MATH 24 – NUMERICAL METHODS FOR ENGINEERING
COURSE SYLLABUS

Course Description

This course is geared towards students who want to know how to transform a set of equations on a page into a working computer program. Topics will include root finding, discrete and continuous optimization, gradient descent, solution of linear systems, finite element methods, and basic methods in computational geometry. We will also discuss how real numbers are represented by computers, especially insofar as they affect precision and accuracy of calculations. Techniques will be applied in a series of projects focused on engineering applications.

Instructor Information

Prof. Matt Zucker  
Office: Hicks 219 – office hours: Monday 2:00 PM - 4:00 PM, and by appointment  
Phone: (610) 328-8636  
Email: mzucker1@swarthmore.edu

Meeting Times

Lecture: Hicks 211, Tuesday, Thursday 2:40 PM - 3:55 PM  
Labs: Hicks 212, Wednesday, 1:15 PM - 4:00 PM

Prerequisite

MATH 025/026 or its equivalent, or permission of the instructor.

Textbooks


Assignments and grading

Homework consisting of math, short answer questions, and small programming exercises will be assigned weekly. There will be five larger projects/labs which are both more open ended and more programming intensive, as well as a self-directed final project. The course has two midterm exams and a final exam. Grading will follow approximately the divisions shown below:

- Homework: 20%
- Projects/labs: 35%
- Midterm exams: 2 x 15%
- Final exam: 15%

Collaboration policy

- Homework should be completed individually.
- Projects and labs should be completed in groups of two.
- Although you may discuss the homeworks and labs with your other classmates, I expect that the work you turn in is your own. You are not permitted to directly copy answers or source code under any circumstances.
- If you do discuss your solutions with your classmates, I expect you to disclose any such collaboration clearly in your writeups and/or reports. Err on the side of caution – it’s the best way to avoid awkward conversations about suspicious similarities between assignments with no attribution of credit.
- Cite any external sources used, including the textbook, web sites, discussions with other professors, etc.

Late policy

Homework will generally be assigned on Thursday, and due at the start of class the following Thursday. An assignment may be turned in up to four days late (i.e. on the following Monday) for half credit. Students get two free late turn-ins without penalty.

Due to the collaborative nature of the work, labs and projects will be strongly penalized for lateness.

I will do my best to accommodate you in extraordinary circumstances. Bear in mind that advance notice of such circumstances is always better.

Webpage

The course webpage is at http://www.swarthmore.edu/NatSci/mzucker1/e19_s2016/index.html. This page will be regularly updated with assignments, projects and reading. You are expected to be responsible for checking for webpage updates in a timely fashion.