MATH 610: EARLY GRADUATE RESEARCH (3 CREDITS, SPRING 2016)

TTH 9:30AM – 10:50AM, 1322 HOOVER HALL

http://www.public.iastate.edu/∼rossmani/math610/

INSTRUCTOR

James Rossmanith
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Office Hours: TTh 3:00pm-4:00pm (or by appointment)

PREREQUISITES

Math 373 or 481 or 561 (introductory class on numerical analysis) or equivalent.

COMPUTER LANGUAGE

MATLAB (MATrix LABoratory): Available in computer labs and can be freely download via IT Services.

SCIPY (Scientific Python): Can be freely to download at https://enthought.com/products/canopy/academic/.

COURSE DESCRIPTION

Math 610 is a one-semester course designed to introduce first-year graduate students in mathematics to research. The Spring 2016 semester will focus on computational mathematics (aka numerical analysis and scientific computing).

The course will consist of 2-3 groups of 3-4 students that will work through a particular peer-reviewed published journal article. This journal article will be chosen by the instructor and each group will have a different journal article. The goal is to work through the paper, including going to various background references, and then developing code and/or analysis to reproduce some aspect of the paper. Each group is responsible for completing several tasks, including the following:

1. Creating a git repository of all the group's work;
2. Submitting weekly notes of the group's progress;
3. Creating a final writeup of the group's work;
4. Creating/giving a final presentation of the group's work;
5. Meeting with the instructor at least twice a week to give updates and discuss various aspects of work.

GRADING

40% – writing assignments (weekly notes, final paper due 5/3 at 11:45am)

30% – presentations (midterm on 3/10, final 4/21, 4/26, 4/28)

30% – participation

LEARNING OUTCOMES

- Learn how to read and understand a technical journal article in the field of computational mathematics.
- Learn how to execute collaborative research in a small group.
- Learn how to use Git for collaborative research.
- Learn how to translate descriptions of an algorithm/method from a technical journal article into usable computer code.
- Learn how to write a technical mathematical paper in LaTeX.
- Learn how to write and present a LaTeX beamer presentation.

GROUP MEETINGS WITH INSTRUCTOR

Group 1. T/Th 9:30am - 9:55am

Group 2. T/Th 9:55am - 10:20am

Group 3. T/Th 10:20am - 10:50am

DISABILITY ACCOMMODATIONS

If you have a disability and require accommodations, please contact the instructor early in the semester so that your learning needs may be appropriately met. You will need to provide documentation of your disability to the Disability Resources (DR) office, located on the main floor of the Student Services Building, Room 1076, 515-294-6624.

Class Days

WEEK	TUESDAY	THURSDAY
1	Jan. 12	Jan. 14
2	Jan. 19	Jan. 21
3	Jan. 26	Jan. 28
4	Feb. 2	Feb. 4
5	Feb. 9	Feb. 11
6	Feb. 16	Feb. 18
7	Feb. 23	Feb. 25
8	March 1	March 3
9	March 8	**March 10** **Presentations**
10	**March 15** **Spring Break**	**March 17** **Spring Break**
11	March 22	March 24
12	March 29	March 31
13	April 5	April 7
14	April 12	April 14
15	April 19	**April 21** **Presentations**
16	**April 26** **Presentations**	**April 28** **Presentations**

FINAL PAPER DUE: Tuesday, May 3rd at 11:45am.