

Math 4933
Section: 002

Mathematics Major Seminar
TTh 2:00 – 3:15
SCEN 402

Spring 2019
Prof. Matthew Clay

Office: SCEN 326

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Course Website: <http://mattclay.hosted.uark.edu/Teaching>

Office Hours: Tuesday: 1:00 – 2:00, Thursday: 9:00 – 10:00 and Friday: 3:00 – 4:00
If you are unable to use any of the above times, please make an appointment to see me.

Prerequisites: Senior standing and a mathematics major, or departmental consent.

Goals: There are two goals for this course. The first goal is to put a capstone on your undergraduate mathematics education by examining three *mathematical gems*: ideas in mathematics that are elegant, sophisticated and accessible. The three gems we will look at are: the Farey diagram and continued fractions, Google's PageRank algorithm, and RSA cryptography. The other goal is to provide a venue for fulfilling the Fulbright College writing requirement of a research/analytical paper (referred to as the "written project").

Readings:

- *Topology of Numbers* by Allen Hatcher (Chapter 1: The Farey Diagram & Chapter 2: Continued Fractions)
- *Google's PageRank and Beyond* by Amy Langville and Carl Meyer (Chapter 4: The Mathematics of Google's PageRank)
- *A Methods for Obtaining Digital Signatures and Public-Key Cryptosystems* by R.L. Rivest, A. Shamir and L. Adleman

Academic Honesty Policy: As a core part of its mission, the University of Arkansas provides students with the opportunity to further their educational goals through programs of study and research in an environment that promotes freedom of inquiry and academic responsibility. Accomplishing this mission is only possible when intellectual honesty and individual integrity prevail. Each University of Arkansas student is required to be familiar with and abide by the University's "Academic Integrity Policy" which may be found at <http://honesty.uark.edu>. Students with questions about how these policies apply to a particular course or assignment should immediately contact their instructor.

Class Conduct/Participation: Attendance is expected. After two unexcused absences, points will be deducted from participation grade.

Homework: Homework will be assigned periodically pertaining to in-class lectures and the written project.

Presentations: All students will give four presentations during the semester. The final presentation will cover the written project.

Major Field Test for Mathematics: All students are expected to take the Major Field Test for Mathematics during the final exam period. This test is an essential assessment tool used by the Department of Mathematical Sciences.

Course Grade:

- Participation - 15%
- Homework - 30%
- Presentations (2%/3%/7%/8%) - 20%
- Written Project - 25%
- Major Field Test (Tuesday, May 7, 12:45 – 2:45) - 10%

Letter grades: A : 100 – 90; B : 89 – 80; C : 79 – 70; D : 69 – 60; F : 59 – 0

Important Dates

Monday, January 14	Classes start
Monday, January 21	Last day to drop without W
Thursday, January 24	Topic for project due
Thursday, February 7	Outline of project due
Tuesday, March 12	First draft of project due
Monday, March 18 – Friday, March 22	Spring Break
Tuesday, April 16	Final draft of project due
Friday, April 19	Last day to drop with W
Thursday, May 2	Last day of classes
Tuesday, May 7	Final Exam (12:45 – 2:45)

See <http://calendars.uark.edu> for the complete academic calendar and final exam schedule.

Special Accommodation: Students who are registered with the Center for Educational Access must notify the instructor in writing by the end of the first week of class, or within one week of registering with CEA.

Inclement Weather Policy: Class will be held if the University is officially open. Allowances will be made if you are unable to safely reach the campus, but, bravely, class will go on! Do not call the Math office for inclement weather information. Instead, you should call the following telephone number: 575-7000.

Disclaimer: Information on this syllabus is subject to change. Any change will be announced in lecture.