| Math 4933 | **Mathematics Major Seminar** | Spring 2017 |
|---|---|---|
| Section: 002 | TTh 2:00 – 3:15 | Prof. Matthew Clay |
| | GEAR 108 | |

**Office**: SCEN 337        **Email**: mattclay@uark.edu        **Phone**: 575–5195
**Course Website**: `http://comp.uark.edu/~mattclay/Teaching`

**Office Hours**: Monday: 2:00 – 3:00, Tuesday: 9:00 – 10:00 and Friday: 2:00 – 3:00
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**: The are two goals for this course. One is to provide a venue for fulfilling the Fulbright College writing requirement of a research/analytical paper (referred to as the "project"). The other 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.

**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**: Attendance (both physical and mental) in lecture is *mandatory*. Using a mobile device inappropriately counts as an absence and *you will be asked to leave the classroom.*

**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                                      - 25%
- Presentations                                 - 20%
- Written Project                               - 30%
- Major Field Test (Tuesday, May 9, 12:45 – 2:45 PM)    - 10%

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

## Important Dates

| | |
|---|---|
| Tuesday, January 17 | Classes start |
| Monday, January 23 | Last day to drop without W |
| Thursday, January 31 | Topic for project due |
| Thursday, February 9 | Outline of project due |
| Thursday, March 16 | First draft of project due |
| Monday, March 20 – Friday, March 24 | Spring Break |
| Tuesday, April 11 | Final draft of project due |
| Friday, April 21 | Last day to drop with W |
| Thursday, May 4 | Last day of classes |
| Tuesday, May 9 | Final Exam (12:45 – 2:45 PM) |

*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.