

NUMBER THEORY

MATH 261

FALL 2011

Classroom: FB 213

Instructor: Dr. Katharine Ott

Office Location: 733 POT

Office Hours: MW 2:00 – 3:00pm, Tues 10:00 – 11:00 am, and by appointment

Course webpage: http://www.math.uky.edu/~kott/index/MA261_F11

Meeting Times: MWF 1:00pm – 1:50pm

Office Phone: (859) 257-6815

Email: katharine.ott@uky.edu

Course Philosophy and Objectives: This course will be taught with the method of *Inquiry Based Learning*, which is also known as the *Moore Method*. Your textbook contains a series of Exercises, Questions, Lemmas and Theorems, but no proofs. You, the students, will be responsible for proving these statements on your own. In class, you will present these proofs at the board and explain your reasoning to your peers. As a class, we'll work together to determine whether or not a proof is correct. Our progress will be slow, but that's okay. The goal is for you to gain a complete understanding of the material that we cover by *actively doing mathematics* rather than passively listening to lectures. In this course you will learn how to manipulate definitions, construct rigorous mathematical arguments, learn various methods of proof, and develop mathematical writing and presentation skills. We will also cover the fundamentals of number theory, which include many simple and deep results about integers.

Text: *Number Theory Through Inquiry*, by David C. Marshall, Edward Odell and Michael Starbird, The Mathematical Association of America, 2007.

Office Hours: I hold office hours for your benefit and I encourage you to take advantage of them. You do not need an appointment if you plan to attend regularly scheduled office hours. If you cannot make my posted hours I will be happy to set a meeting time that is convenient for the both of us.

Course Web Page: The course web page will be updated regularly with class announcements and homework assignments. You will also find a copy of the class syllabus and my contact information on the page, as well as a Google Calendar for our class. This calendar includes homework due dates, exam dates, office hours, and extra-curricular math events.

Grading:

Participation and Homework	30%	A	90-100%
Journal	20%	B	80-89%
Exam 1	15%	C	70-79%
Exam 2	15%	D	60-69%
Final Exam	20%	E	Below 60%

Participation: You are expected to participate in class discussions and present solutions on the board when called upon in class. I will keep track of how many times you present at the board, and also note your participation in class discussions. Due to the nature of this course, *it is absolutely essential that you attend class*. You will be allowed 3 absences with no penalty. After this point, I reserve the right to drop your Homework and Participation grade by 10 points for each additional absence. In exceptional cases such as extended illness, I will allow you to make up these points by visiting me in my office hours.

Homework: I will assign 1 – 3 problems or proofs per week to be handed in by each individual. I expect all proofs to be written in full sentences and grammatically correct. Each proof or problem will be graded on the following scale:

4	Correct mathematical proof and very well written
3	Small mathematical and/or grammatical errors
2	Contains good ideas, but overall an incorrect mathematical proof
1	Significant mathematical errors
0	Come and see me for help!

If you receive a grade of 2, 1, or 0 on any proof, you may turn that proof in again for an entirely new grade. I will keep only the highest score. Rewrites are due exactly one week from when I return homework. You may work with your peers to prepare problems but you must write up solutions individually.

Journal: You will be responsible for keeping a written record of all proofs that we present in class. I do not want you to copy verbatim what you see on the board. Rather, I suggest you write down the “key steps” needed to solve the problem, and return later to write your own proof. By keeping a clean written copy of all the work we do in class you will be creating your own textbook for the course. I will collect your journals on the date of each exam to check your progress. You are allowed 3 passes each time, meaning you can choose any three theorems to skip. As with homework, you are allowed to discuss proofs and work together, but you are required to write everything in your own words.

Exams: Two mid-term exams and a final exam are scheduled for this course. The mid-term exams will be given in class on Friday, September 23 and Friday, October 28. Each mid-term will focus primarily on the material covered since the last examination, however you will be responsible for all of the course material up to that point. The final exam is scheduled for Tuesday, December 13, 8:00am – 10:00am. The final exam will be comprehensive. The final exam cannot be rescheduled unless you meet the University requirements. Absolutely no collaboration on exams is allowed.

Class Conduct and Special Accommodations:

- Please be respectful of your classmates and me while in class or office hours. This includes turning off your cell phones and putting away your laptops.
- Cheating on homework or exams will not be tolerated. You are expected to follow the academic integrity standards stated in the University Senate Rules (see Chapter 6, <http://www.uky.edu/USC/New/SenateRules.htm>).
- If you have a documented disability that requires academic accommodations, please see me as soon as possible during scheduled office hours. In order to receive accommodations in this course, you must provide me with a **Letter of Accommodation** from the Disability Resource Center (Room 2, Alumni Gym, 257-2754, jkarnes@email.uky.edu) for coordination of campus disability services available to students with disabilities.

Important Dates:

Wednesday	August 24	First day of classes
Wednesday	August 30	Last day to add a class
Monday	September 5	Labor Day, Academic Holiday
Wednesday	September 14	Last day to drop a class
Friday	September 23	Exam 1
Monday	October 17	Midterm of semester
Friday	October 28	Exam 2
Wednesday – Friday	November 23 – 25	Thanksgiving break
Friday	December 9	Last day of classes
Tuesday	December 13	Final Exam, 8:00am – 10:00 am, FB 213
Friday	December 16	End of Fall 2011 semester

"I hear, I forget. I see, I remember. I do, I understand."

–Chinese Proverb