

Math 246: Number Theory, Section 51, Spring 2010

Instructor: Dr. Nafaa Chbili

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Lectures: MW 11-12:15, Building 42 009.

Office hours: ST 11-12 and MW 10-11.

Prerequisite: Set Theory and Logic.

Textbook: David Burton, Elementary Number Theory, 5th Edition, McGraw Hill, 2002.

Course Contents: Divisibility, Euclidean algorithm, prime numbers, the fundamental theorem of arithmetic, and the sieve of Eratosthenes. Congruences, Chinese Remainder theorem. Fermat's theorem, Wilson's theorem, Euler's theorem, and Diophantine equations.

Tentative Schedule:

1. Chapter 1: Preliminaries (1 week)
2. Chapter 2: Divisibility Theory in the integers (3 weeks)
3. Chapter 3: Primes and their distribution (3 weeks)
4. Chapter 4: The theory of Congruences (3 weeks)
5. Chapter 5: Fermat's Theorem (2 weeks)
6. Chapter 6 and 7: Euler's Theorem (3 weeks)

Course Objectives: The course aims to:

- 1- Introduce fundamental topics of number theory such as: Divisibility, Prime numbers, Congruences and some number theoretical functions.
- 2- Develop the basic skills needed to think abstractly.
- 3- Provide the students with different techniques of proofs.
- 4- Enhance student self-learning and independent thinking by building up proofs and exploring various experiences through assignments and discussions.

Student Learning Outcomes:

- Students will achieve command of the basic concepts of number theory such as divisibility and congruences.
- Students will understand and apply the core theorems and algorithms in number theory.
- Students will achieve proficiency in writing proofs of general statements, involving integers, using different methods such as induction and contradiction.

Assessment:

Test 1: 15%, Date: March 8th, 2010

Midterm (Comprehensive): 20%, Date: March 31st, 2010

Test 2: 15% , Date: May 12th 2010

Final Exam (Comprehensive): 40%, Date: June 7th 2010 , 1-3pm

Quizzes and Homework: 10%

Attendance: Attendance is required for all classes. Students who are absent for any reason more than 15% of required classes are prohibited from participating in subsequent exams and received a grade of “F” for the course.

Grading scale:

A	B+	B	C+	C	D+	D	F
90-100	85-89	80-84	75-79	70-74	65-69	60-64	0-59