

WEBSTER UNIVERSITY

COURSE SYLLABUS

MTHC 5040.01

COURSE NUMBER AND SECTION

Andrea Rothbart

INSTRUCTOR

Number Theory

TERM: Spring, 2006

1. Course Description

This course, designed for teachers grades 5-8, will focus on the arithmetic and algebra of the modular systems (including clock arithmetic) and their applications to empirical problems. The basic ideas of number theory will be studied.

2. Learning Outcomes

The ideas examined in this course will provide teachers with increased number sense, with a deeper understanding of algebra, with experience applying mathematics (beyond grade school arithmetic) to empirical problems, and with some powerful materials for helping their own students better understand algebra and the behavior of numbers (including negative numbers).

3. Schedule

CLASS 1: Introduction to remainders. The Black Magic Device
Mod. 11 arithmetic; remainder tests for division by 11

CLASS 2: Mod. 11 Algebra

CLASS 3 The arithmetic of other modular systems; zero divisors

CLASS 4: Basic Concepts of Number Theory

CLASS 5: The irrationality of the $\sqrt{2}$ and the infinitude of primes.

CLASS 6: Quiz;

CLASSES 7 -9 The Algebra of Modular Systems

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CLASS 10: Remainder Tests

CLASS 11 Quiz

CLASS 12-13: Linear Diophantine Equations: The Football Problem

CLASS 14-15: Male Chauvinist Chess; Orbits on a Modified Chess Board.

CLASS 16: Quiz

4. Resources:

Text Used: "The Theory of Remainders" by A. Rothbart

5. EVALUATION: Based upon class participation, homework assignments and quizzes.

**This syllabus is subject to change at the discretion of the instructor.
Therefore, regular attendance is required.**