

WEBSTER UNIVERSITY

COURSE SYLLABUS

MTHC 5430.01
COURSE NUMBER AND SECTION

Andrea Rothbart
INSTRUCTOR

Topics in Mathematics:
The Real Number System

TERM: Spring, 2006

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SITE

Course Description:

Number and numerations systems will be the focus of this course. In particular, we will study negative number bases; representations of fractions as decimals and ways in which they vary according to the number base of the representation, density properties of rational and irrational numbers; mental arithmetic, and subfields and subrings of the real and complex number systems. Also included will be a unit on finite differences. and recursion.

Schedule:

SESSION 1:

Field Properties; Mental Arithmetic; Whole Number Bases

SESSIONS 2 and 3:

Negative Number Bases; applications

SESSION 4 and 5:

Decimal expansions of rational and irrational numbers in base 10.

SESSION 6 :

Quiz

SESSIONS 7 and 8:

"Decimal" expansions of real nos. in bases other than base 10. Determining periods using relevant concepts from group theory.

SESSION 9:

Density properties of rationals and irrationals; closure properties.

SESSION 10:

Complex numbers, De'Moivres Theorem

SESSION 11: Quiz

SESSIONS 12- 13

Finite differences; applications to empirical problems

SESSION 14 and 15: Recursion; Fibonacci Sequences, Mathematical Induction

SESSION 16:

QUIZ

4. RESOURCES:

There is no textbook; materials will be distributed by the instructor.

5. EVALUATION:

Based on quizzes, homework assignments, and class participation.

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