

WEBSTER UNIVERSITY

COURSE SYLLABUS

MTHC 5320.01
COURSE NUMBER AND SECTION

Andrea Rothbart
INSTRUCTOR

Topics in Mathematics:
The Real Number System

TERM: Fall, 2003

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SITE

1. Course Description:

This course will examine the algebraic properties of the real number system and some of its subsystems. We will also cover the complex numbers, functions, negative number bases, density properties and other related topics.

2. Learning Outcomes:

The student will better understand the real number system, the complex number system, recursion, arithmetic algorithms, mental arithmetic, and the decimal expansion of rational numbers.

3. Schedule:

SESSION 1:

Field Properties; Mental Arithmetic; Whole Number Bases

SESSIONS 2 and 3:

Negative Number Bases; Counting and The four basic operations

SESSION 4:

Decimal. expansions of rational and irrational numbers;

SESSION 5:

Proofs that square root of 2 is irrational.

SESSION 6 :

Quiz

Rothbart; MTHC 5320; p.2

SESSIONS 7 and 8:

"Decimal" expansions of real nos. in bases other than base 10. Length of cycles including relevant concepts from group theory.

SESSION 9:

Density properties of rationals and irrationals; closure properties; The Real Number System

SESSION 10:

Complex numbers, De'Moivers Theorem

SESSION 11: Quiz

SESSIONS 12- 13

Finding polynomials from tables; applications to empirical problems and to Geoboards

SESSION 14: Recursion; Fibonacci Sequence, Mathematical Induction

SESSION 15: Subrings and Subfields of the Real Numbers

SESSION 16:

QUIZ

4. RESOURCES:

Text Used: No textbook; all 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.