Theory of Numbers

Course Description

Dr. Patrick Rault

Math 319, Spring 2011

TR 1-2:15pm or TR 2:30-3:45pm

Description: This course is an introduction to classical number theory dealing with such topics as divisibility, prime & composite numbers, Diophantine equations, the congruence notation, and quadratic residues.

Prerequisites: Math 222 (Calculus 2) and Math 239 (Introduction to Mathematical Proof)

This course is an excellent preparation for: Math 330 (Abstract Algebra)

Inquiry-Based Learning:
This course involves a high degree of inquiry-based active-learning, which emphasizes **doing mathematics** over learning more content. This class will allow you to share your ideas with the class, it will be a fun, relaxed and enjoyable environment. Lecturing will be held to a minimum.

Reduced class size: The instructor has received a grant from the Educational Advancement Foundation to decrease the size of this class to 15 students – this is ideal for inquiry-based learning. Two sections will be offered: TR 1-2:15pm or TR 2:30-3:45pm.

Learning objectives

- Increased aptitude in independent problem solving.
- Ability to unravel abstract definitions and create intuition-forming examples or counterexamples.
- Skill in giving and critiquing presentations.
- Ability to judge whether a mathematical argument is correct and complete.
- Increased comfort in discussing mathematics.
- Written communication of the solution of a mathematical problem via proof, with each step following from previous steps.
- Experience with mathematics research.
- A deep understanding of the arithmetic (divisibility, even vs. odd, prime factorizations, etc) of integers and related number systems.
- Knowledge of the principal results in classical number theory.

NOTE: The low amount of mathematical content on this list is intentional. We will focus on the process of doing mathematics as opposed to covering a high amount of content.