

Instructor: Dr. Chris Black  
Office: Snoqualmie Hall #302B  
Office Hours: W 2:30 - 4:00, and by arrangement  
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Required Text: *A Friendly Approach to Number Theory*, Third Edition, Joseph H. Silverman, Pearson/Prentice Hall, 2006

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#### GOALS FOR COURSE:

Upon completion of MATH 430, students will:

- have experienced the benefits of independent mathematical discovery
  - have strengthened their ability to construct valid mathematical proof
  - have strengthened their confidence at mathematical presentation
  - have an understanding of the fundamental theorems and methodology used in the study of number theory
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#### COURSE PHILOSOPHY:

Number theory lends itself well to a discovery-style course. Silverman's text was chosen specifically because it enables students to immerse themselves in mathematical discovery, and allowing them to uncover the major concepts of number theory for themselves. We will use a modified Moore method for the course, in which the course is student-led. The students will work on the problems individually, and present their solutions to the class. There will be no lecture by the instructor, although I am available both inside and outside of class to answer questions.

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#### PROBABLE COURSE TOPICS:

- Fermat's Last Theorem
  - Divisibility and greatest common divisors
  - Congruences & Euler's Formula
  - Prime numbers
  - Successive squaring
  - Diophantine approximation
  - Pell's equation
  - Transcendental numbers
  - Binomial coefficients & Pascal's triangle
  - Fibonacci sequence and recurrence sequences
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#### GRADING:

Homework:	500 - 560 points, as needed
Participation:	50 points
Attendance/Citizenship:	20 points

#### PARTICIPATION:

As mentioned previously, this course will be student-led. I will act as a moderator while the students present exercises and proofs to one another. I will answer questions and steer the discussion, however the momentum for the course will be created by the students themselves. Ordinarily, the work will be presented by volunteers and critiqued constructively by the other students. If you don't volunteer yourself, however, you will be 'volunteered'. Your participation grade will depend on the quality (and quantity) of your work in both volunteering and critiquing.

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#### HOMEWORK:

This course consists entirely of exploring, solving and presenting solutions to the problems posed in the text. NOT ALL PROBLEMS IN THE TEXT HAVE KNOWN SOLUTIONS, AND NOT ALL ARE GOING TO BE SOLVABLE. All solutions will be presented to the class, and two from each section will be selected to be collected and graded. As the solutions will have been presented and critiqued by the class, the written version turned in will be the final version. Each collected problem is worth 10 points.

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#### ATTENDANCE/CITIZENSHIP:

Discussion, interaction, and group problem solving will all be important aspects of this course, which necessitate your attendance. Citizenship addresses your behavior and comportment with class members and the instructor. We each need to be respectful of other students, other cultures, and differing ideas within our learning community. In particular, in a class where you are expected to critique each other, we need to keep our comments constructive.

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#### HONOR AND RESPECT:

Each of us should consider our placement at this institution to be a privilege. We need to have respect for one another, and for ourselves. In light of these facts, cheating in any form will not be tolerated. You are encouraged to work together on homework problems, however anything you turn in with your name on it should have been written by you alone (or with members of an assigned group). In a course where much of your grade is determined by your proof writing, plagiarism is a concern. The word "plagiarize" is defined by Merriam-Webster as "to steal and pass off (the ideas or words of another) as one's own: use (another's production) without crediting the source." This is a very serious offense, and will jeopardize your position in the program.

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#### DISABILITY SERVICES:

Students with disabilities may arrange for academic adjustments by providing the instructor with a copy of the "Confirmation of Eligibility for Academic Adjustments" from the Disability Support Services Office as soon as possible. To obtain this form, contact the Disability Support Services Office at the main campus at [dssreceipt@cwu.edu](mailto:dssreceipt@cwu.edu) or (509) 963-2171.