

Professor: Dr. Chris Black  
Office: Snoqualmie Hall #302B  
Office Hours: T 10:15 - 11:15, and by arrangement  
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Required Text: *Number Theory Through Inquiry*, 1st edition, Marshall, Odell & Starbird, Mathematical Association of America, 2007

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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 ability to communicate mathematical ideas orally
  - 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. Starbird's text was chosen specifically because it enables students to immerse themselves in mathematical discovery, and allows them to uncover the major concepts of number theory. The students will work on the problems and write up solutions individually outside of class. Problem solutions will be presented on the board weekly. There will be no lecture by the professor, although I will be available both inside and outside of class to answer questions.

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#### PROBABLE COURSE TOPICS:

Number theory deals exclusively with properties of integers. Course topics will include, but are not limited to, divisibility, linear Diophantine equations, modular arithmetic, prime numbers, the Fundamental Theorem of Arithmetic, Fermat's Little Theorem, Euler's Theorem, Polynomial congruences and Euler's  $\phi$ -function.

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#### HOMEWORK:

This course consists entirely of exploring and solving problems posed in the text. The homework sheet identifies three types of problems: exercises, major results and minor results. All assigned exercises and major results will be collected, and the student can choose as many of the minor results as necessary so that a total of 10 major and minor results are submitted. From the solutions collected, a few from each section will be selected to be graded. Each graded proof is worth 10 points, and exercises are worth a variable number of points.

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#### QUIZZES:

There will be two take-home quizzes during the quarter, each worth 50 points. Quizzes must be done individually.

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#### FINAL EXAM:

The 100-point final exam will cover the basic concepts and techniques of number theory. The exam is scheduled for Thursday 12/9 from 9:00 - 11:00 am.

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#### PARTICIPATION:

As mentioned previously, this course will be student-led. I will act as a moderator while the students work through and present solutions. I will answer questions and steer the discussion, however the momentum for the course will be created by the students themselves. Each student is expected to present at least one problem per week, to be discussed and constructively critiqued by the class. Your participation grade will depend on the quality (and quantity) of your work in both presentation and analysis.

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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 comportsment 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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#### GRADING:

Homework:	500 points
Quizzes:	100 points
Participation/Attendance/Citizenship:	50 points
Final Exam:	100 points

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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. In a course where much of your grade is determined by your proof writing, plagiarism is a concern. The word “plagiarize” is defined by the New Oxford American Dictionary as “the practice of taking someone else’s work or ideas and passing them off as one’s own.” Plagiarism includes, but is not limited to:

- Copying another student’s work and submitting it as your own
- Submitting a proof copied from the internet
- Submitting a proof copied from another text

Any incidence of plagiarism will not be tolerated, 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 professor 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 Bree Callahan, director of Disability Support Services for the Westside University Centers at (206) 439-3800 ext.3866 or by email at bcallaha@cwu.edu.