

# NUMBER THEORY

MATH 430 | FALL QUARTER 2012

## **INSTRUCTOR:**

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## **COURSE DESCRIPTION:**

In this course students will demonstrate their understanding of the mathematical concepts of elementary number theory. They will apply number theory procedures to solve problems and prove the solutions of others. Finally, they will demonstrate an understanding of the historical and cultural perspective of number theory development.

## **COURSE RATIONALE:**

This course is important to mathematics and mathematics education majors for three reasons. First, number theory is important at all levels of mathematics from arithmetic to unsolved problems. Second, need many and varied courses that require proof writing. Finally, students will study the creative human endeavor that is Number Theory from both a historical and cultural perspective.

## **COURSE RESOURCES:**

- Blackboard account with enrollment in MATH 430
- A Friendly Introduction to Number Theory by Joseph H. Silverman (4<sup>th</sup> edition)

## **COURSE OBJECTIVES:**

By the end of the course, teacher candidates will be able to:

| Outcomes   | Assessment                                       | Standards                         |
|--|--|-----------------------------------|
| solve and prove problems representing the number theory concepts of: <ul style="list-style-type: none"><li>• Pythagorean Triples</li><li>• Divisibility</li><li>• Prime Numbers</li><li>• Greatest Common Divisors</li><li>• Fundamental Theorem of Arithmetic</li><li>• Congruence Modulo Equivalence relations</li><li>• Euler's Theorem</li><li>• Fermat's Little Theorem</li></ul> | Blog writing, written proofs, project, and tests | NCTM 1- 16<br>WACME 1-14          |
| use historical and cultural implication of number theory to create and explain engaging mathematics lessons aligned with the state mathematics standards.  | Blog writing and project                         | NCTM 1- 16<br>WACME 1-14<br>CTL 1 |

## **ASSIGNMENTS AND EVALUATION GUIDELINES:**

The instructional and assessment strategies for this course are designed to inform you of your progress in achieving the course performance outcomes. The instructors will give you frequent feedback on your progress in meeting these performance outcomes.

| Assignment   | Points     |
|--|------------|
| Discussion Board (3 replies-5 each)  | 15         |
| Written Exercises (3 points for each exercises - approximately 25 exercises) | 75         |
| Exams ( 3 exams worth 10 points each)  | 300        |
| Mathematics Curriculum Project   | 60         |
| <b>Total Points</b>  | <b>450</b> |

**Grading Scale**

93-100% = A, 90-93% = A-, 87-90% = B+, 83-87% = B, 80-83% = B-, 77-80% = C+, 73-77% = C, 70-73% = C-, 67-70% = D+, 63-67% = D, 60-63%, 0-60% = F Please see the CWU Catalog for the eligibility requirements for an incomplete (I).

**Performance Expectations**

All of the assignments and lessons can be found in Course Modules of Blackboard.

**COURSE POLICIES:****Instructor Feedback/Communication**

You will receive specific feedback on your blog assignments with in the blog and by e-mail. I will use the Announcements tool in Blackboard to communicate changes to the course and other course information.

**Suggestions for Success**

Take the responsibility for your own achievement of these performance objectives. You can get individual help by e-mail, phone, or in person in my office. If at any time you have trouble-using Blackboard or do not understand an assignment make sure to contact the instructor. Use the activities, assignments, and instructor to insure that you understand the concepts and can demonstrated this understanding in the assignments.

**Student Feedback/Communication**

I welcome all feedback on the course. My preferred method of communication with individual students is via email. I am also available for office hours. If you experience a legitimate emergency that will prevent you from completing required coursework on time, I expect you to communicate with me at the earliest reasonable opportunity.

**Late and Uncompleted Work**

- If extenuating circumstances exist, contact instructor.
- All course assignments must be completed to pass the course.

**UNIVERSITY POLICIES:****Academic Integrity**

Academic Integrity is a standard set for this course. Students are expected to complete all of their coursework and assignments using their original words and ideas and will properly cite the words and ideas of others. Students are also expected to be honest in their interactions with the instructor. A student found to have not upheld these expectations is subject to failing this course and shall be subject to disciplinary action or sanction. The University catalog defines the term "academic dishonesty" in all its forms including, but not limited to:

- cheating on tests;
- copying from another student's test paper;
- using materials during a test not authorized by the person giving the test;
- collaboration with any other person during a test without authority;
- knowingly obtaining, using, buying, selling, transporting, or soliciting in whole or in part the contents of an unadministered test or information about an unadministered test;
- bribing any other person to obtain an unadministered test or information about an unadministered test; substitution for another student or permitting any other person to substitute for oneself to take a test; plagiarism" which shall mean the appropriation of any other person's work and the unacknowledged incorporation of that work in one's own work offered for credit;
- "collusion" unauthorized collaboration with any other person in preparing work offered for credit.

Documented incidences of Academic Dishonesty will be referred to Office of the Vice President of Student Affairs.

**Special Needs**

If you have a disability that may prevent you from meeting course requirements, contact the instructor immediately to file a Student Disability Statement and to develop an Accommodation Plan. Course requirements will not be waived but reasonable accommodations will be developed to help you meet the requirements. You are expected to work with the instructor and the CWU Disability Support Specialist to develop and implement a reasonable Accommodation Plan. For contact information at Center for Disability Services (CDS) please visit <http://www.cwu.edu/~dss/cms/>.