Instructor:	Dr. Chris Black
Office:	Snoqualmie Hall #302B
Office Hours:	M 2:00 - 3:00, Th 10:15 - 11:45, and by arrangement
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Required Text:	*An Introduction to Abstract Algebra with Notes to the Future Teacher*, Nicodemi, Sutherland & Towsley, Prentice Hall, 2007

Goals for course:

Math 360 students will:

- ... improve their ability to think abstractly and critically;

- ... be able to communicate in precise written mathematical language, using correct logic and notation;

- ... extend their understanding of polynomial algebra contained in secondary mathematics curricula;

- ... have a firm grasp on the basic concepts of ring and field theory, and the facility to apply them to particular concrete examples;

- ... actively participate in the classroom dialogue, both as an individual and as a member of a small group, and be an active partner during in-class exercises.

Course Philosophy:

In this course, we will be introduced to advanced algebra. It will seem at first that this material has nothing at all to do with the high school algebra that you know and love, but we will continuously tie the material in this course to the material taught in the secondary school curriculum. More than likely, this is the first contemporary mathematics that you have studied. Abstract algebra is a dynamic, active field – many of my mathematical colleagues are engaged in research in the areas of group theory, ring theory, and matroid theory. In this course, we will only be exposed to the theory of rings and fields; the proverbial tip of the iceberg. Concepts and methodologies from algebra are used in diverse fields such as computer science, physics, and chemistry, as well as mathematics.

Probable Course Topics:

- ▷ Basic number theory: congruences, modular arithmetic, & the Euclidean algorithm

- ▷ Applications of number theory: divisibility tests and public key encryption

- ▷ Rings: primary examples $\mathbb{Z}_m$

- ▷ Fields: primary examples $\mathbb{C}$ and $\mathbb{R}$

- ▷ Polynomial algebra

- ▷ Factoring in polynomial rings

- ▷ Solving cubic and quartic equations

- ▷ Polynomial congruences

- ▷ Extension fields

- ▷ Roots and factoring

Grading:

Homework:	300 - 350 points, as needed
Take-Home Exams:	200 points (2 @ 100 pts each)
Final Exam:	100 points
Directed Readings:	20 - 24 points (10 - 12 @ 2 pts each)
Participation:	10 points
Citizenship:	10 points

Homework:

There are two types of homework problems in this course: computational problems and proofs. All assigned problems will be collected, though not all will be graded. In addition to the point total for the graded problems, 5 points will be awarded for completeness of the assigned problems for each section of material. Some of the collected problems will be proofs, and often the problems I have chosen to collect present an important part of the theory of the course. Proofs will be graded out of 10 points according to the *Proof Writing Guidelines*. Computational problems will have varying point values.

If necessary, graded problems may be re-written and re-graded within one week of your receipt of the graded assignment, but the 5 points for completeness cannot be made up through rewriting the assignment. Solutions to non-graded problems will be posted on blackboard *after* the assignment is collected the first time. Assignments may be accepted late at my discretion; late assignments will forfeit both the 5 completeness points and the right to a rewrite.

You may work in groups to discuss the homework problems, however the final version should be written individually. **It is considered plagiarism to find solutions to proofs assigned as homework in other texts or on the internet.** You are invited to come see me for hints on homework problems if you get stuck.

Directed Readings:

It is crucial that you read your textbook. This material is fairly dense, and it takes more than one exposure to be able to work with the onslaught of definitions and theorems. In order to get your brain used to the new terms, it is helpful to have read over the section *before* attending the lecture (repetition!). On a daily basis, I will hand out a directed reading assignment. Read the section and answer the questions on the reading assignment. I do not expect you to puzzle over the proofs of the theorems, or attempt the homework; just read over the material and think about the definitions & examples.

Upon entering the classroom, turn the reading assignment in on the front desk. I'll quickly scan the stack before starting lecture. This helps you absorb the lecture material since the terms have some familiarity, and helps me predict where the material needs extra elucidation. The daily reading assignments are worth 2 points each, graded solely on whether or not you made an honest effort. As their primary purpose is to guide my lectures, *directed reading assignments will not be accepted late under any circumstances.*

PARTICIPATION:

We will spend a portion of each class session working in small groups, and I will often ask students to present their work to the class. Your participation will be graded based on your interactions with your peers, your attentiveness and on-task behavior during class and how often you volunteer to present your solutions.

CITIZENSHIP:

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.

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 and take-home exams, 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.

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 dssrecept@cwu.edu or (509) 963-2171.