

EMAT 4000 Connections to Abstract Algebra Syllabus, Fall 2007

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Office hours: W 12:30 – 1:30.

Seminar purposes

- (1) to revisit high school mathematics on a deeper level, and
- (2) to support you in your mathematics courses

The intent is that with the support of these seminars you will learn undergraduate mathematics in ways that will help you in your future work as mathematics teachers. Please send me questions about the ideas in your mathematics courses, as those questions will help me organize the seminar to be partly responsive.

Many of the homework problems will be intended to give you sufficient “calculation experience” to be able to see the ideas embedded in the theorems and necessary for the proofs.

Seminar Goals

- To learn mathematics deeply and with understanding
- To see mathematics as more than knowing “what to do”
- To develop internal conviction about how mathematical ideas work and why certain statements are true
- To develop habits of working together, asking and pursuing questions, looking for connections, and looking for multiple explanations
- To develop precision (rigor) in use of mathematical language and notation
- To develop intuitive understandings of abstract ideas

Seminar requirements

- Six regular homework assignments on the following topics
 1. Modular arithmetic
 2. $\mathbf{Z}/n\mathbf{Z}$
 3. Complex numbers
 4. Polynomial rings
 5. Polynomial rings
 6. Ideals
- Two sets of lesson plans to be used in a secondary mathematics classrooms
- Attendance

Participation in discussions will be taken into consideration when final grades are determined.

Homework

The homework problems are intended to help you develop good explanations for mathematical ideas. Thus, an answer alone will receive little credit, and an algebra-only

solution will be considered incomplete. Use words in between the symbols, write in complete sentences, and be sure to include enough explanation so that a classmate could understand your reasoning.

You are encouraged to collaborate with your classmates on the homework, but when you sit down to write up a problem, you should work on your own. And as you collaborate, be sure to give yourself plenty of time to think through each problem yourself. The point is that you will often deepen your understanding as you try to write a careful explanation, and you will learn little by merely reading someone else's solution.

Grading

The homeworks will be worth 10 points each and each set of lesson plans will be worth 20 points. Class participation will account for at most 3 points of your grade.

Disclaimer

The class requirements and corresponding number of points assigned may change during the course of the semester, as may the topics covered.