

MME 529 – Syllabus

NUMBERS, POLYNOMIALS AND ALGEBRAIC STRUCTURES

Instructor: William J. Martin

Office: SH 305A

Phone: 831-6764

e-mail: martin@wpi.edu

Office hours: MW 3:00-4:00

or by appointment

MA 590 – Summer 2017

MME 529: Algebra for Educators

Text: “Contemporary Abstract Algebra”

by Joseph Gallian

Meetings: 4:00-6:50pm Tues, SH003

This is a course in abstract algebra particularly tailored to educators. The goals of the course are three-fold. First and foremost, we aim to improve our understanding and appreciation of mathematics as a subject and algebraic systems in particular. We build competence, confidence and perspective when we understand the subject at a deeper level than what we teach.

The second goal of the course is to cultivate creative skills of lesson plan development. We want to motivate our students not only to master the subject matter in our courses, but to connect these studies to important and exciting current events in science and technology. We will take plenty of time to talk about applications of algebra. But we also want to equip ourselves with a toolchest of special topics, fun projects, and historical anecdotes that will prepare us for particularly challenging situations in the classroom. (By “challenging” here, I mean “mathematically challenging” being fully aware that the classroom presents us with many other challenges!)

The third goal is to maintain a dialogue concerning the connections between high school preparation and mathematical expectations at the university level. How best can we prepare our high school students for success in college? Focusing, in this particular course, on algebra, what broad themes and core skills are necessary for the student who wishes to move on to study in the sciences and engineering? How do today’s standards and uniform tests relate to our true goals of preparation for survival in a highly technical world?

I anticipate that I will learn a lot more from my students than they will learn from me. But I hope to offer my perspective — as an instructor, as a mathematician, and as a fan of technology — as a possible way to help practitioners be more effective and energized as teachers in the classroom.

WORKLOAD

Each student is expected to attend and participate in every scheduled class meeting. Students will regularly be called upon to prepare lecture material and present it at the board. Some assignments will be given, mostly aimed at designing lesson plans that touch on the material learned in class.

Each team of 2-3 students will present two projects, one in Week 6 and one in Week 10.

We will have an in-class midterm exam on Tuesday, May 30th and an in-class final exam on Tuesday June 27th.

Your grade will be apportioned as follows: %40 on your presentations to the class; %10 homework; %25 projects; %10 mid-term; %15 final exam.

TERM SCHEDULE

Here is a rough outline of what we will cover in the 10 meetings we have together:

Week 1 (April 25)	Natural Numbers, Factorization, etc.	(mostly lecture)
Week 2 (May 2)	Modular Arithmetic and Euclidean Algorithm	(guest lecturer Goulet)
Week 3 (May 9)	Applications of Finite Rings and Fields	
Week 4 (May 16)	Abstract Groups and Symmetry	
Week 5 (May 23)	Group Theory for Kids	
Week 6 (May 30)	Projects on First Half	(including mid-term exam)
Week 7 (June 6)	Ring Theory	
Week 8 (June 13)	Unique Factorization	
Week 9 (June 20)	Fields and Applications	
Week 10 (June 27)	Project Presentations	(including final exam)

INFORMATION ON THE WEB

The course web page is

<http://www.wpi.edu/~martin/TEACHING/current.html>

ACADEMIC HONESTY

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies which can be found at

<http://wpiacademicintegrity.weebly.com>

All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see me.

STUDENTS WITH DISABILITIES

Students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Disability Services Office (DSO) as soon as possible to ensure that such accommodations are implemented in a timely fashion. The DSO is located at 157 West Street, (508) 831-4908.

If you are eligible for course adaptations or accommodations because of a disability (whether or not you choose to use these accommodations), or if you have medical information that I should know about please make an appointment with me immediately.