

Math 431 Abstract Algebra II, Spring 2014

Basic Info:

Meeting Times/Locations

- Section 0001: MWF Roop Hall G010, 11:15-12:05

Instructor: Dr. Joshua Ducey

Email: duceyje@jmu.edu

Website: <http://educ.jmu.edu/~duceyje>

Office Location: Roop 339

Office Hours:

- Monday 12:20–1:10pm
- Wednesday 2:30–3:20pm
- Thursday 10:30–11:30
- By appointment

Book: Contemporary Abstract Algebra by Joseph Gallian, 8th Ed.

Course Content:

We will cover ring theory, which starts at Chapter 12 in our text. We will then move on to study fields and finish with some Galois theory if time permits.

Homework:

I will assign homework each week. A subset of the assigned problems will be collected for grading. A large number of the problems will involve writing a mathematical proof. Your grade will be based not only on correctness, but also on clarity and style. Three of the assigned problems will have a “*” next to them—these are the *board problems*.

Board Problems:

Each day at the start of class I will randomly call on one of you to solve a board problem in front of the class. These board problems are indicated with a “*” so that you may work on them at home and have a beautiful solution ready to present to your classmates. I will not be impressed with you figuring out these problems “on the fly.” The correctness of your solution, and also your clarity and style of presentation will be taken into account.

Tests:

There will be four exams this semester: three in-class tests and a cumulative final exam. Of the three in-class tests, your lowest score will be dropped. The final exam cannot be dropped.

Project:

There will be a “group project,” including presentations to the class near the end of the semester. Details will be announced in class.

Some Tips For Success:

- **Take the homework very seriously.** Consistent, regular, hard work on the homework problems is absolutely the best thing you can do to succeed in this class. Slate out time to do all of the problems assigned, not just the ones that are collected.
- Don't let yourself fall behind! If you feel like you are struggling, make time to see me immediately. This is an upper level mathematics class and if you let things slide it may become impossible for you to catch up.
- Read the book carefully, with a pencil and paper nearby. Our text is actually quite readable for an upper level mathematics textbook. Take advantage of this. Ideally you should read the chapter we are covering in lecture *before* coming to class.
- Come to class each day.

Getting Help:

You are encouraged to work on homework with your classmates. However, anything that you turn in to me must be written up independently and in your own words. My office hours are fixed times when I will be in my office to help you, but you can also make an appointment to see me at a different time (just email me).

Evaluation:

Homework: 30%

Board Problems: 5%

Tests: 40%

Project: 5%

Cumulative Final Exam: 20%

Grade Scale:

[90 – 100] A- to A

[80 – 90) B- to B+

[70 – 80) C- to C+

[60 – 70) D- to D+

[0 – 60) F

Final Exam Time:

- Section 0001: Monday 5/5/2014, 10:30–12:30

General University Policy: www.jmu.edu/syllabus

MATH 431. Abstract Algebra

Goals of the Course

- (1) To develop an understanding of the logical structure and style of mathematics by:
 - (a) Using reason in an orderly, cogent fashion.
 - (b) Writing clear, well organized solutions to problems.
 - (c) Evaluating critically and using mathematical definitions.
 - (d) Constructing proofs of mathematical theorems using direct and indirect arguments.
 - (e) Evaluating critically the quality of a mathematical proof by considering such things as completeness, assumptions, precision, and flaws.
- (2) To develop an understanding of the theory of calculus and algebraic structures by knowing:
 - (a) The meanings of the concepts of algebraic structures, substructures and quotient structures.
 - (b) The basic concepts of embeddings, extensions, homomorphisms and isomorphisms.

Nature of the Course Content

MATH 430-431. Abstract Algebra.

3 credits each semester. *MATH 430 offered fall and spring; MATH 431 offered spring.* An introduction to groups, rings and fields.

Prerequisite for MATH 430: MATH 238 or MATH 300; and MATH 245 or consent of instructor. Prerequisite for MATH 431: MATH 430.