

## MAS 6332: ALGEBRA II

**Instructor:** Jeremy Booher

**Email:** jeremybooher@ufl.edu

**Instructor's Office:** LIT 488

**Course Time:** MWF Period 3 (9:35 - 10:25)

**Course Location:** LIT 205

**Course Webpage:** on canvas (<https://elearning.ufl.edu/>)

**Office Hours:** will be posted on canvas, and by appointment

“My methods [i.e. algebra] are really methods of working and thinking; this is why they have crept in everywhere anonymously.”

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Emmy Noether

### 1. COURSE DESCRIPTION

This course is a sequel to the first-year graduate algebra sequence. This semester we will study projective, injective, and flat modules, introduce the basic ideas in homological algebra, and then further develop the theory of commutative and non-commutative rings. Homological algebra appears throughout algebraic topology and geometry, while commutative rings underly algebraic number theory and algebraic geometry. This course can serve as preparation for the algebra PhD qualifying exam.

### 2. LEARNING RESOURCES

2.1. **Textbook.** Abstract Algebra by Dummit and Foote, third edition.

2.2. **Supplementary Topics.** A few topics are not covered in the textbook: additional resources for them will be provided on canvas.

2.3. **Other References.** Hungerford's Abstract Algebra is sometimes used as an alternate textbook for the course. The writing style is terser than Dummit and Foote. If you find Dummit and Foote too verbose, try this one. Lang's Algebra is encyclopedic: it goes into more depth but due to its length and style is more useful as a reference than as a textbook.

2.4. **Office Hours.** You are encouraged to come to office hours if you are struggling: I am happy to help. You are also encouraged to come to office hours if you are doing well or are bored: I am happy to talk about math more generally and tell you interesting things. If the default times do not work for you, please contact me and we can find an alternate time.

### 3. EXPECTATIONS AND GRADING

Many of the policies in this class are inspired by research in education that shows that “active learning” is more effective than traditional lectures. In particular, this means that class-time will be spent solving problems and discussing concepts in addition to lecturing. The goal is to have time in class, where guidance is available, to practice synthesizing and

applying concepts and to practice solving problems. Reading the textbook will be essential to obtain a complete overview of a topic and to see details omitted during class.

**3.1. Reading Assignments.** Readings will be assigned, and should be completed *before* the topic is discussed in class. The goal is not to master the material at this stage, but to learn the basics and be ready to participate in activities during class. These assignments are an important part of your homework. After class, revisit the readings to solidify your understanding.

**3.2. Homework Exercises.** Practicing solving problems is vital to learning mathematics. You should focus on writing clear proofs and explaining your reasoning. It is fine (and fun) to work with other students on solving the problems. But you should write your solution down on your own, and be able to reproduce it. It is fine to look in your notes or a textbook for background material related to the problem. Do not search the internet for solutions to that particular question. This will only cheat you out of a learning opportunity.

**3.3. Exams.** There will be a midterm exam and a final exam. The midterm exam will be during class, tentatively on March 3rd. The official final exam will be 12:30 p.m - 2:30 p.m on May 4th, which is the time set by the registrar. There may be a take-home component in addition to/instead of an in-person exam.

**3.4. Grades.** Your final grade will be based on the following:

- 40% from homework;
- 25% from the midterm;
- 35% from the final exam;

To allow for illness or other unexpected events, the lowest two homework assignments will be dropped. Grades will be no lower than the following:

A : [93, 100]%   A- : [90, 93)%   B+ : [87, 90)%   B : [83, 87)%   B- : [80, 83)%  
 C+ : [77, 80)%   C : [73, 77)%   C- : [70, 73)%   D : [60, 70)%   E : [0, 60)

**3.5. Grading Disputes.** Any grading problems must be brought to my attention within one week of the work being returned.

## 4. OTHER POLICIES

**4.1. Communication.** Course Announcements will be posted on Canvas. It is the student's responsibility to make sure they receive notifications for this course. For personal matters, students should e-mail the instructor via their official UF e-mail address.

**4.2. Make-Up Policy for Homework/Exams.** Make-up homework/exam work is allowed only when written evidence of an official University excused absence is provided (<http://catalog.ufl.edu/UGRD/academic-regulations/attendance-policies/>).

The instructor must be notified as soon as possible, preferably *before* the homework due date or exam with as much advanced notice as possible. A detailed account of the situation and supporting documents are required.

**4.3. Diversity, Inclusion, and Equity.** To foster a positive learning environment, students and instructors have a shared responsibility. We want a safe, welcoming, and inclusive environment where all of us feel comfortable with each other and where we can challenge ourselves to succeed.

I am committed to diversity and inclusion of all students in this course. I acknowledge, respect, and value the diverse nature, background, and perspective of students and believe that it furthers academic achievements. It is my intent to present materials and activities that are respectful of diversity: race, color, creed, gender, gender identity, sexual orientation, age, religious status, national origin, ethnicity, disability, socioeconomic status, and any other distinguishing qualities.

**4.4. Honesty Policy Regarding Cheating, Plagiarism, etc.** UF students are bound by *The Honor Pledge* (<http://sccr.dso.ufl.edu/policies/student-honor-code-student-conduct-code/>) which states,

*We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."*

The Student Conduct Code (<http://sccr.dso.ufl.edu/process/student-conduct-code/>) specifies a number of behaviors that are in violation of the honor code and the possible sanctions. Furthermore, you are obligated to report any condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please or consult with the instructor in this class.

**4.5. Accessibility and Accommodations.** Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the Disability Resource Center by visiting <https://disability.ufl.edu/students/get-started/>.

It is important for students to share their accommodation letter with their instructor and discuss their access needs as early as possible in the semester.

**4.6. Online Course Evaluations.** Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at <http://gatorevals.aa.ufl.edu/students/>.

Students will be notified when the evaluation period opens, and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via <http://ufl.bluera.com/ufl/>. Summaries of course evaluation results are available to students at <http://gatorevals.aa.ufl.edu/public-results/>.

**4.7. Change.** Information contained in the course syllabus, other than the grade and absence policy, may be subject to change with advance notice, as deemed appropriate by the instructor.