

MA 542: Modern Algebra II
Spring 2023

Instructor: Anna Medvedovsky
Email: medved@bu.edu
Office: CCDS 414

Lecture: MWF 1:25–2:15pm in COM 213

Zoom info: Meeting ID: 964 5122 5226; passcode given in class
(or see email with direct link)

Office hours: MW 2:30–3:30pm or by appointment

Textbook: Beachy and Blair, *Abstract Algebra*, 4th ed. (2019)

Website: <http://math.bu.edu/people/medved/Teach/542S2023/Land.html>
(or see email for direct link)
All course information (homework, announcements) will be posted on the website.
I do not anticipate using Blackboard.

Key dates: February 17: in-class quiz
March 20: in-class midterm
May 10 (to be confirmed by BU): Final exam

Course content

MA 542 is a second-semester course in abstract algebra: commutative rings, fields, and Galois theory. We will cover chapters 4, 5, 6, 8 of Beachy and Blair (BB).

Prerequisites

Students should be able to write basic proofs and be familiar with group theory at the level of MA 541 (at least BB 2.3, 3, 7).

Additional prerequisites: properties of integers (division algorithm, Euclidean algorithm, unique factorization into primes), integers modulo n and units modulo n , functions (well-definition, composition, inverse functions), equivalence relations, complex numbers, and basic linear algebra. See BB 1.1–2.2, A.5, A.7.

Expectations

- I expect that you will attend every class, engaged and ready to participate. (At the same time, I do not take attendance; I understand that sometimes life intervenes.)
- If you miss class for whatever reason, it is your responsibility to get notes and find out what was announced from a classmate. Make contact with a classmate today!
- After every class, I expect you to review your notes and try to resolve any confusion you may have had. If you cannot resolve something you're confused about your own, please come ask me in office hours or after class. Plan for about an hour of review time for every hour of class time — and that's before you start working on the homework assignments or studying for tests.
- If you are quarantined, or have to miss more than one class in a row for whatever reason, or have a known conflict with a key date, or are struggling with math or otherwise, please get in touch with me as soon as you are able and let me know what's going on. Obviously

your health and safety must come first. But I cannot respond to problems I do not know about.

Homework

Homework assignments are an essential part of the course!

Schedule: We will have biweekly homework. [Exception: one week for the first assignment.]

Collaboration: You must collaborate with one or two other classmates on the first homework set.

Thereafter, you are very much encouraged to work together on problem sets. However, you must hand in solutions which are written by you and in your own words. For each problem you turn in, please identify your sources: classmates you worked with, anyone else you asked for help, or books or websites that you consulted other than the textbook.

First assignment: The first assignment, mostly review of material from BB chapters 1 and 2, is due 1/27. You must collaborate with one or two other classmates.

Grading: I will grade a selection of problems from each homework assignment.

Keeping up with homework assignments is crucial for success in the course. If you run into trouble, do not wait — get help!

Introductory meeting

A requirement of the course is to meet with me one-on-one, ideally in the first week, for about 10–15mins. This can be done in office hours (you may have to wait for other students) or you may make a separate appointment.

Tests

We will have one short (20–30min) in-class quiz, one in-class midterm, and a university-scheduled final exam.

- **Quiz:** ~~February 15~~ **February 17** (Friday)
 - **Midterm:** March 20 (Monday)
 - **Final** (tentative): May 10 (Wednesday) 12–2pm
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Final grades

Your grade in the course will be computed as follows:

- Homework: 40% at least
- Tests: 40% at least (in 1:2:3 proportion Q:M:F)
- Instructor discretion: 5% (course participation, challenge homework problems)

The remaining 15% will be taken up by your homework or test grade, whichever is higher. Or...

Optional project

This would be a short paper or something more creative exploring an application of field theory or Galois theory, in the second half of the semester. This project would count for that remaining 15% of your grade (but would never lower your grade).

Resources

For details about additional help and resources (tutoring room, helpful notes on certain topics, etc.), please see the course website.