



Syllabus MTH 561T, 661T: Abstract Algebra I

Textbook: My lecture notes *Introduction to Algebra: Rings First* will be made available on my website, at the address <https://www.math.miami.edu/~bruno/algebra3.pdf>. I keep updating it, so refresh every now and then. If you want a book with plenty of exercises, I suggest Cooperstein *Introduction to Groups, Rings, and Fields*.

Content: The tentative outline is:

- Preliminaries and modular arithmetics: three weeks.
- Permutations: two weeks
- Groups: three weeks.
- Vector spaces: remaining time.

This is part I of a two-semester course, so what I do not manage to squeeze into this semester (e.g. rings and modules) will simply be moved over to the second one (MTH 562).

Rules:

- Grading policy: Two midterms and a final; the final weighs double. The date for the midterms are decided by majority, as long as the first midterm is before the fall break.
- Makeups will be given only in case of documented medical excuse, and typically result in oral makeup exams. Please inform me via email.
- Class participation and homework do not influence your grade directly, but they may play an important role in determining final grades, especially in borderline cases.
- Homework will be assigned in class, also in the form of completing proofs. You are supposed to keep track of the exercises, as I do not keep a list.
- If you spot a weakness, feel free to do extra exercises, or go over the proofs explained in class. At the university, you are your own personal trainer! The role of the professor is different.
- Per official UM policy, ‘all students are bound by the Academic Integrity Policy, which is intended to promote and support an atmosphere conducive to learning. Each student’s work is to be their own unless express permission is given by the instructor. Students are bound by the policy and instructors also bound to report violations.’
- In particular, for tests, no ChatGPT/Claude/Gemini, no Alexa, no Chegg, we have ways to find out. (You may use AI to *prepare* for tests, if you so wish.) Do not ruin your academic career for a slight improvement in a grade. In case there is a concrete suspicion that a test was leaked, we will probably resort to oral exams for the whole class, or for a subset of it. (There’s control groups etc., so belonging to such subset does not mean that I think you cheated.)

Tips:

- Questions and feedback during class are always very welcome. I also have office hours. Emails may go unanswered, since I receive hundreds of them, so I would prefer that you ask in class or in office hours.
- On day 1 you may want to write down the contact of a few classmates, so you can refer questions like 'hey what was the homework for today' to them. The professor is getting old and distractful.
- Attendance to office hours is not compulsory, but recommended. Students who come to office hours every week usually make way more progress than students who show up by the dozen the day before the test.
- Tests are designed to cover the material explained in class. You are expected to keep track of the topics presented. Whatever I cover in class can be on the test (even if not in the book). Whatever I do not cover in class, cannot be on the test (even if it is in the book). It is usually very useful if you prepare 'summaries' of what I covered. For the same reason, I allow one cheat sheet (which may be written front and back) at each written exam: You may write in it whatever you want.
- The problems in the tests are not going to be identical to problems you have already exercised on. The professor may want to see what you would do when facing a new challenge that can be solved with tools you already have. So try not to learn a procedure 'by heart', like you would do for a repetitive task; it's best if you understand the ideas behind a solution technique, so that you can adapt them to a new problem.
- I would prefer if you do not use the computer in class, because typically those of you who take handwritten notes tend to perform better. My guess (but I have no proof for this) is that the computer tends to distract both you and the students sitting behind you. That said, if this is your 'work mode' and you wish to prove me wrong, I do not really mind if you use a tablet or a computer; please sit in the last rows though, so that we are all sure that you are not distracting the students behind you.
- Zoom policy: The class is in person; we will only use zoom in exceptional cases, e.g. on the first week, in case of storms, or if I am away for a conference. There will be no class on Thanksgiving week. If you keep the camera on during the first week, and connect with a first name-last-name account, it helps me learn your names. But this is a favor to me, not a policy: if you wish to keep the camera off, that is fine by me.
- It sometimes happens that students find mistakes in my notes or in what I write on the blackboard. I am happy when this happens and I value corrections a lot!, that's the best way to let me know that you are on top of the subject.
- The book has many exercises. Feel free to do them on your own if you spot a weakness in your preparation.
- Cell phones and ipads are allowed in class, but must be on silent mode. Same policy for pets, kids, and lovers.

With this, I wish you a lovely Fall semester here at The U!



Bruno Benedetti
Associate Professor