

Math 412 – Sections 1 and 2 – Winter 2019

Instructor: Dr. Eloísa Grifo **Email:** grifo@umich.edu **Office:** East Hall 4843

Course webpage: <http://www-personal.umich.edu/~grifo/Teaching/Math412/>

Course assistant: Pleum Piriyatamwong

Office Hours:

- Tuesday 5–6 pm
- Wednesday 3–4 pm
- Thursday 4–5 pm

Sections:

- Section 1 Tuesday and Thursday 8:30 – 9:50 am
- Section 2 Tuesday and Thursday 10:00 – 11:20 am
- Section 3 Taught by Dr Jack Jeffries

Text: *Abstract Algebra: an introduction* by Thomas W. Hungerford, 3rd edition.

Note: earlier editions are OK but homework numbering and page numbers may differ. It will be your responsibility to match things up if you use an older edition.

Course Description: Math 412 is an introduction to abstract algebra, required for all math majors but possibly of interest also to physicists, computer scientists, and lovers of mathematics. We will begin with ring theory: our first goal is to prove the Fundamental Theorem of Algebra, about the ring you've been studying since elementary school, the integers. We will continue by studying basic properties of rings and ring homomorphism (ideals, quotient rings, fields). Here, another important example, which shares many properties of \mathbb{Z} , the integers, is the ring of polynomials over a field. Finally, we will study the basics of group theory (groups, group homomorphisms, symmetry groups, the symmetric group, normal subgroups, quotient groups, and group actions on sets).

In addition to developing many examples, students will prove nearly all statements in this course.

Course expectations: Math 412 students are responsible for learning the material on their own through individual reading of the textbook before coming to class. Like in Math 217, you will often work together on more theoretical concepts in small groups using worksheets in class. You will be expected to work out more computational exercises on your own, which will be supplemented with some webwork when possible. You will also have a graded, written problem set (think Math 217 Part B) due Fridays. Attendance is required. There will be two exams (one midterm and a final). There will be many quizzes, some on the reading.

Email: You are responsible for information contained in course email messages sent to your official “umich.edu” email address. Please check your email regularly.

Quizzes: There will be a quiz every Tuesday, with the exception of the first quiz, which will be on Thursday, January 17. Absolutely no make-ups will be given, but I will only count your ten best quiz scores when I compute your final grade.

Problem Sets: There will be a problem set due every Thursday starting on Thursday, January 24. No late homework will be accepted, but only the 10 best scores will count.

Webwork: Webwork will be due every Friday starting on January 18.

Participation: You are required to attend class regularly and on time and to participate in group work.

Grades:

Webwork	10%	Quizzes	20%
Problem sets	15%	Participation	5%
Midterm	20%	Final Exam	30%

Exams:

Midterm: Tuesday, February 26, 6–8 pm, CHEM 1400.

Final Exam : April 25, 4–6 pm, EH 1360.

Academic Integrity: According to the *LSA Community Standards of Academic Integrity*, the College “prohibits all forms of academic dishonesty and misconduct. Academic dishonesty may be understood as any action or attempted action that may result in creating an unfair academic advantage for oneself or an unfair academic advantage or disadvantage for any other member or members of the academic community.” Do NOT cheat. If you cheat in this class, you risk failing the course. If you have any questions about what is, or is not, allowed in this course, please ask.

Advice on how to get an A in this course:

- Always go through the worksheets slowly again yourself after each class, to make sure you fully understand. Check your work against the answers provided to make sure you did not overlook any subtleties. Tuesday quizzes are testing how well you know the definitions/statements/worksheet concepts.

- Always read the section we will cover before class.
- Come to class on time and do not leave early. If for some reason you absolutely have to arrive late or leave early, please let me know in advance and do so discretely.
- Start the problem set early and work together! You should make major progress over the weekend so that you can ask questions in class and/or office hours.
- Start the webwork early.
- Get help when needed! Find people you like working with!

Accommodations for Students with Disabilities: If you think you need an accommodation for a disability, please let me know as soon as possible. In particular, a Verified Individualized Services and Accommodations (VISA) form must be provided to me at least two weeks prior to the need for a test/quiz accommodation. The Services for Students with Disabilities (SSD) Office (G664 Haven Hall; <http://ssd.umich.edu/>) issues VISA forms.

Final Note: If you have any questions or concerns during the semester, please do not hesitate to contact me.