

M 431 Abstract Algebra I

Fall 2019, MTWF 1:00-1:50, Math 311

Course Information

- **Instructor:** Kelly McKinnie, Math 111, 243-5694, kelly.mckinnie@umontana.edu
- **Textbook:** Abstract Algebra, Theory and Applications by Thomas W. Judson. Open source book, last edited July 10, 2019. Available on course moodle page.
- **Prerequisites:** M 221 (linear algebra) and M307 (intro to abstract math)
- **Software:** Some assignments will require the use of SAGE. Sage (sagemath.org) is a free, opensource, software system for advanced mathematics, which is ideal for assisting with a study of abstract algebra. Sage can be used either on your own computer, a local server, or on CoCalc (cocalc.com). Do not pay for this service! All exercises for this class can be done using the free account option.
- **Office Hours:** See <http://www.umt.edu/people/mckinnie>

Catalog description

Offered autumn. An introduction to modern ideas of algebra through the study of groups, rings, and fields. Level: Undergraduate-Graduate

Learning Outcomes:

Upon completion of this course, a student will be able to:

- Explain the basics of group and ring theory;
- Explain the important definitions and to be able to use them correctly;
- Demonstrate proficiency at simple verification proofs,
- Demonstrate improved proficiency in constructing proofs (focusing on correctness and clarity),
- Use proper English in written assignments.

Important dates:

Dates	Topic
Sept 4	Last day students can add a course on CyberBear
Sept 16	Last day students can drop a course on CyberBear or change grading option to audit
Oct 28	Last day to add/drop course by paper w/o Dean's approval.
Dec 6	Last class day, and last day to petition to drop/add and change to CR/NCR.
Dec 11	Final exam (required) Wednesday December 11, 1:10 – 3:10 pm in Math 311.

Course Requirements & Grading (+/- grading will be used):

- **Problem Sets:** 50% (Reading Questions 5%, weekly homework 45%)
- **Midterm Exams 1,2:** 30%. *Tentative* dates are Tues, Oct. 8 and November 25. Makeups are given at instructor's discretion and only in cases of emergency or other important circumstances. If you cannot make it to an exam, you must let me know BEFORE the exam is given.
- **Final Exam (comprehensive):** 20%.
- **Complete 2 non-graded assessments;** beginning of semester assessment 2nd class day and end of semester assessment, date TBD.

Course guidelines and policies:

Incompletes

Incompletes are given at the discretion of the instructor. They are only considered in cases where the student has been in attendance and doing passing work up to three weeks before the time of request. The request must be made based on circumstances beyond the student's control causing the student undo hardship in completing the requirements of the course on time. Negligence and indifference are not acceptable reasons.

Classroom and Course-related Behavior

University policy requires that all of us in the classroom treat each other with respect, and refrain from behavior that will disrupt the educational process. Please refrain from using any electronics during class that are not directly related to what we are doing. If you would prefer to be called by a different name, or gender pronoun, than listed on the course roster, please let your instructor know.

Student Conduct Code

All students need to be familiar with the Student Conduct Code. You can find it at <http://www.umt.edu/student-affairs/dean-of-students/default.php> or by searching in the "A to Z Index" on the UM home page. In particular, discrimination and harassment are not tolerated at the University of Montana. If you feel that you have been subjected to discriminatory or harassing behavior, please contact the Office of Equal Opportunity and Affirmative Action at 243-5710 or <http://www.umt.edu/policies/browse/personnel/discrimination-harassment-sexual-misconduct-stalking-and-retaliation> for help in addressing the situation. You can also report the discrimination or harassment to me or to another faculty member you trust.

Academic Honesty

All students must practice academic honesty. Academic misconduct is subject to an academic penalty by the course instructor and/or a disciplinary sanction by the University.

Disability modifications

The University of Montana assures equal access to instruction through collaboration between students with disabilities, instructors, and [Disability Services for Students](#). If you think you may have a disability adversely affecting your academic performance, and you have not already registered with Disability Services, please contact Disability Services in Lommasson Center 154 or call 406.243.2243. I will work with you and Disability Services to provide an appropriate modification.

Comments

We will cover most of Chapters 1 -- 11, 16 – 18, 20, 21. Specific sections will be listed on the moodle course page as the semester progresses.

Homework

Homework will be due at 5pm of the listed due date. You may turn it in in class or in the front office. If you complete all of the assigned "logs" your lowest homework score will be dropped.

You are allowed and even encouraged to work with others on the homework as long as ***the solutions you present are your own***. Plagiarism will not be tolerated. This includes copying from another student and from internet sources. That being said, work together! Come up with the ideas behind the solutions as a group, then write up your own solution. Avoid reading others solutions before writing up your own. Problems will be graded based on two considerations:

- Logical correctness.

- Ease of readability. (This is of utmost importance in our class. I think of this class as one where you refine your proof reasoning and writing skills). Technically correct but hard to read/understand/follow proofs will not receive full points. Caution: this is subjective.

Homework assignments will sometimes include a component from SAGE (see above).
 Instructions for completing these problems will be included in the assignment.

UTMOST

During Fall 2019 I will be participating in the [UTMOST](#) project. UTMOST is studying how instructors and students use open source software and textbooks. Both our book and SAGE are open resources. As part of the project I will give you a letter inviting you to join the UTMOST project as a participant. There are no additional class requirements for participants. Those who do not wish to participate will complete all class assessments but will not have the UTMOST linked assessments included in the UTMOST analysis of our course. Students will be assigned a unique ID which allows UTMOST to follow your assessments while never being told any identifying information about you.

All students, regardless of participation in the UTMOST project will receive student IDs for the class. Please put these IDs on all homework and exams. In addition to submitting some participating students' work to UTMOST this allows me to grade your work without knowing who submitted it, reducing implicit bias.

Grade Scale

Cutoff Percentage:	93%	90%	87%	83%	80%	75%	70%	65%	62%	58%	55%
Grade:	A	A-	B+	B	B-	C+	C	C-	D+	D	D-

Graduate Increment

Students taking M431 with the graduate increment will have enhanced homework assignments and will take different Exams (I, II and final).