

Math 395A: Algebra IV
Spring 2020

The course website is <https://www.uvm.edu/~cvincen1/math395.html>.

Logistical Information: This course counts for 3 credit hours, and meets on MWF 2:20pm-3:10pm in Votey 223.

Instructor Information: Professor Christelle Vincent, office E445 in Innovation Hall.

For content (i.e. mathematical) questions, please post your question to Coursewire at <https://campuswire.com/c/G421F3607>. For personal matters, please reach me by email at christelle.vincent@uvm.edu. My office hours are by appointment.

Textbook: Dummit and Foote's *Abstract Algebra* 3rd edition. Later on we will use Atiyah and MacDonald's *Introduction to Commutative Algebra*, but you do not need to buy it if you don't want to.

Course Description and Goals: In Math 395 we will review field theory (Chapters 13-14), and then study ring theory (Chapters 7-9) and module theory (Chapters 10 and 12). We will go through qual problems, then end the semester with a study of commutative algebra and homological algebra, as time permits. Please see the tentative course schedule posted online for a list of sections covered; more to come soon. The goal of the course is to give the student a strong foundation in abstract algebra, as well as to prepare for the UVM qualifying exam in abstract algebra. The course will consist in lectures, with time to go over questions from the homework. Most Mondays there will be a quiz on the homework that is due that day.

Attendance: You are expected to attend every lecture. If for whatever reason you cannot attend lecture, you are responsible for asking a classmate to tell you what you have missed. If you miss a quiz, you will get a score of zero on that quiz.

Grading: Your grade for this class will be based on your performance in the following activities, weighted as follows:

Homework: 25%

Quizzes: 20%

Midterm: 25%

Final Exam: 30%

All of your grades will be available for your review on Blackboard.

Homework: Homework will be due every Monday around class time, except as posted. Part of the homework **must** be typeset, and turned in electronically on BlackBoard, and part of the homework can be turned in by hand. It will be clearly indicated which problems are which on the homework.

During study weeks the homework will be graded normally out of 10. The typed up problems will be graded carefully, and the problems turned in by hand will be surveyed quickly for completion and correctness.

During qualifying exams weeks, the homework will consist of six qualifying exam problems, and will be graded as follows:

- 10/10 for six complete problems
- 9.5/10 for four complete problems and substantial progress on the other two problems
- 8.5/10 for nine complete lettered parts
- 6/10 for six complete lettered parts
- 3/10 for three complete lettered parts

You are encouraged to work on the homework with your peers. However, the work you turn in must be your own! If your homework substantially resembles the work of another student's, you will both receive a grade of zero on this assignment.

Your lowest homework score will be dropped. There will not be make-up homework or any late homework.

Quizzes: Every Monday, except as posted, there will be a quiz. During study weeks the quiz will ask for definitions and statements of theorems. During qualifying exams week, you will be asked to solve one problem, by yourself, during class. In any case, you will not have access to any notes.

There will not be any any make-up quizzes under any circumstances. However, your two lowest scores will be dropped.

Midterm: There will be an in-class midterm on Monday March 23. It will cover all of the *ring theory* material we will have covered in class until then (the parts of Chapters 7-8-9 of Dummit and Foote that were covered in class plus the qualifying exam material). You will not have access to any notes. You will need to solve two problems from a list of qualifying exam problems.

The midterm will be graded as follows:

- 10/10 for two complete problems
- 9/10 for a complete problem and substantial progress on the other problem
- 8/10 for substantial progress on both problems
- 7/10 for some progress on both problems, or substantial progress on one problem
- 6/10 for some useful notions on both problems
- 3/10 for some useful notions on one problem

Exams: There will be a university-scheduled final exam. It will consist of six qualifying exam problems on field theory and ring theory.

The Final Exam will be graded as follows:

- 10/10 for six complete problems
- 9.5/10 for four complete problems and substantial progress on the other two problems
- 8.5/10 for nine complete lettered parts
- 6/10 for six complete lettered parts
- 3/10 for three complete lettered parts

The final exam is on May 5, from 4:30pm to 7:15pm, in Votey 223.

If you have a conflict with our final exam in this class, you must inform me in writing at least one week before the last day of classes.

If an emergency occurs and you need to miss the exam, you must notify me in writing within 24 hours of the exam. Please include the reason and documentation.

Statement on diversity: Mathematics can be learned and enjoyed by everyone, regardless of gender, age, race, sexual orientation, or other personal characteristics. As a group we will work to create a space where we all feel welcomed and encouraged, and any actions or speech that detract from this atmosphere will not be tolerated. In particular, we will be mindful of encouraging others

to let us know if they do not already know something and do everything to support them in their learning. We will not say that things are “trivial.” We will offer corrections gently and with the intention of helping the other, as opposed to making ourselves feel good.

Course evaluations: All students are expected to complete an evaluation of the course at its conclusion. These will be anonymous and confidential, and the constructive criticism offered will be used to improve subsequent versions of the course.

Religious accommodations: Students have the right to practice the religion of their choice. If you believe you might need accommodations to take part in religious celebrations, please submit in writing to me by the end of the second full week of classes your religious holiday schedule for the semester. Together we will work on arranging a way to make up any work you might miss. For all homework and quizzes, you will be expected to turn in your work on time, or in advance, as necessary, except in very special circumstances.

SAS: In keeping with University policy, any student with a documented disability interested in utilizing accommodations should contact SAS, the office of Student Accessibility Services (previously ACCESS). Once you have your accommodation letter from them, I will be available to meet with you privately to discuss the accommodations you plan to use in this course.

Statement about academic integrity: The University strives to provide an environment that encourages all students (undergraduate, medical, graduate, and continuing education) to learn, create, and share knowledge responsibly. As society entrusts our students and faculty to pursue knowledge and report their discoveries truthfully, any deliberate falsehood or misrepresentation undermines the stature of the University. The following standards of academic integrity are deemed necessary for fulfilling the University's mission, as well as its motto: *Studiis et Rebus Honestis* (For honorable studies and pursuits). These standards are also necessary for evaluating the quality of student work in a fair manner. For further information, please visit <https://www.uvm.edu/sites/default/files/UVM-Policies/policies/acadintegrity.pdf>.

Statement on alcohol and cannabis in the academic environment: As a faculty member, I want you to get the most you can out of this course. You play a crucial role in your education and in your readiness to learn and fully engage with the course material. It is important to note that alcohol and cannabis have no place in an academic environment. They can seriously impair your ability to learn and retain information not only in the moment you may be using, but up to 48 hours or more afterwards. In addition, alcohol and cannabis can:

- Cause issues with attention, memory and concentration
- Negatively impact the quality of how information is processed and ultimately stored
- Affect sleep patterns, which interferes with long-term memory formation

It is my expectation that you will do everything you can to optimize your learning and to fully participate in this course.

Statement on Student Athletes: In order to be excused from classes, student athletes should submit appropriate documentation to the Professor in advance of all scheduling conflicts within the first two weeks of class. Those missing class are expected to submit make-up assignments within a reasonable time period.