Course Description

Algebra I is an abstract algebra course aimed at graduate students who want to deepen their knowledge on algebraic structures such as Groups, Rings and Fields. The study of these algebraic structures is a fundamental part of any Mathematics Education. Furthermore, they are important tools in many research areas ranging from Coding to Algebraic Geometry, Algebraic Topology to Physics and so on.

In this course, we will start with a review of undergraduate Group Theory and then cover selected topics from Advanced Group Theory including but not restricted to the Sylow Theorems, Groups with Generators and Relations, and Matrix Groups. After that we will study Rings with an emphasis on Polynomial Rings (and make connections to Algebraic Geometry), and continue towards the notion of Fields. Throughout the course, we will also focus on improving proficiency in writing mathematical proofs.

As a prerequisite, you will need a C- or better grade in MTH 316, graduate standing or instructor’s permission to enroll. Some background on matrices and complex numbers is preferable.

Course Goals

At the end of this course, you should be able to

- Prove fundamental results about algebraic structures.
- Describe several examples of groups, rings and fields.
- Be able to apply results from the course to new situations and problems.
- Create sophisticated mathematical arguments.
Textbook


Additional Reading Material


Grading

Final grades will be based on class work, homework assignments, one midterm exam, and a comprehensive final exam. Total weight of each component is distributed as follows:

<table>
<thead>
<tr>
<th>Points available</th>
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<tbody>
<tr>
<td>Class Work</td>
<td>12.5% – details will be given in class.</td>
</tr>
<tr>
<td>Homework Assignments</td>
<td>12.5% – details will be given in class.</td>
</tr>
<tr>
<td>Midterm Exam</td>
<td>30% – <em>Thursday, March 5, 2020</em> usual class time.</td>
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<tr>
<td>Final Exam</td>
<td>45% – <em>11:30am - 2:30pm, Thursday, April 30, 2020.</em></td>
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Letter Grade Distribution

Final grades will be determined according to the following scale.

| 92 – 100   | A          |
| 90 – 91.99 | A-         |
| 87 – 89.99 | B+         |
| 82 – 86.99 | B          |
| 80 – 81.99 | B-         |
| 77 – 79.99 | C+         |
| 72 – 76.99 | C          |
| 70 – 71.99 | C-         |
| 67 – 69.99 | D+         |
| 60 – 66.99 | D          |
| 0 – 59.99  | F          |
Exam and Quiz Make Up Policy

Makeup exams/quizzes may be scheduled in the event you are unable to attend exams/quizzes under the following conditions. In particular, if you must miss the exam because of a scheduling conflict, you must notify your instructor before, not after, the exam, and emergencies require you to contact your instructor within 24 hours. See University Manual sections 8.51.10 and 8.51.14 for guidelines.

- If your reason for missing the exam as scheduled is (i) a University sanctioned event for which verifiable documentation can be provided (including another scheduled class), (ii) a responsibility to an employer that cannot be rescheduled (with documentation from your employer), or (iii) Religious holidays, then you MUST INFORM YOUR INSTRUCTOR 48 HOURS IN ADVANCE OF THE EXAM AND PROVIDE DOCUMENTATION IF REQUESTED. Makeup exams will be scheduled after the actual exam, and preferably before the class period when exams are to be handed back, but no later than one week after the original date.

- If the reason for missing the exam as scheduled is due to (i) illness (with verifiable documentation from a medical provider), or (ii) an emergency (with appropriate documentation), then you MUST INFORM YOUR INSTRUCTOR WITHIN 24 HOURS OF THE EXAM and provide documentation upon your return. Failure to notify your instructor within 24 hours will result in a 0 for the exam. No exceptions. Makeup exams may be scheduled no later than a week after the original date, unless the illness or emergency precludes this, in which case the makeup exam will be given on a common date during the last few weeks of the semester.

- If your circumstances do not meet either of the above (no documentation, a non-emergency excuse without sufficient notice, etc.), then you will receive a zero for the missed exam. No exceptions.

Electronic Devices

Cell phones should be kept on silent mode during class. All other electronic devices (ipads, ipods, laptops, etc.) should be turned off during class. They can be a distraction to you and your classmates. Excepted from this are tablets used for note-taking.

Academic Honesty Policy

Cheating is defined in the University Manual section 8.27.10 as the claiming of credit for work not done independently without giving credit for aid received, or any unauthorized communication during examinations. Students are expected to be honest in all academic work. The following are examples of academic dishonesty:

- Claiming disproportionate credit for work not done independently
- Unauthorized possession or access to exams
- Unauthorized communication during exams
- Unauthorized use of another’s work or preparing work for another student
- Taking an exam for another student
- Altering or attempting to alter grades
- The use of notes or electronic devices to gain an unauthorized advantage during exams
- Facilitating or aiding another’s academic dishonesty
The resolution of any charge of cheating or plagiarism will follow the guideline set forth in the University Manual sections 8.27.10-8.27.21.

Furthermore, course content and outlines, exams, and assignments created by instructors shall be considered the instructors’ intellectual property. Course materials shall not be distributed, shared in any public domain or third party website, or sold without prior written consent of the instructor. See the University Manual section 8.27.22.

Special Needs

Any student with a documented disability may contact the instructor early in the semester so that reasonable accommodations may be arranged. Students can contact Disability Services for Students: Office of Student Life, 330 Memorial Union, 874-2098. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Incomplete Grade

University of Rhode Island regulations concerning incomplete grades will be followed. See University Manual sections 8.53.20 and 8.53.21 for details.

Religious Holidays

It is the policy of the University of Rhode Island to accord students, on an individual basis, the opportunity to observe their traditional religious holidays. Students who plan to be absent from classes or examinations for religious holy days that traditionally preclude secular activity shall discuss this with the appropriate instructor(s) in advance of the holy day. See University Manual section 8.51.11 for details.

Standards of Behaviour

Students are expected to treat faculty and fellow classmates with dignity and respect. Students are responsible for being familiar with and adhering to the published “Community Standards of Behavior: University Policies and Regulations” which can be accessed in the University Student Handbook web.uri.edu/studentconduct/university-student-handbook/

Course Schedule - TBA