Intro. to Modern Algebra - MTH 343 (CRN 16125)

Fall 2018

3 credits

• Class meetings: MWF 2-2:50pm in Bexell 321

• Instructor: Dr. Filix Maisch

• E-mail: maischf@math.oregonstate.edu

• Office: Kidder 348

• Office hours: MWF 3:00-3:50pm (Fri. in MLC)

Prerequisites: MTH 341 and 355, with a minimum grade of C-.

Textbooks: No textbook is required. It is recommended that you get either (or both) of the following as a resource:

• A First Course in Abstract Algebra, Fraleigh (any edition)

• Abstract Algebra, Herstein (any edition)

Course Description: This course is an introduction to groups, rings, and fields with an emphasis on the integers and polynomial rings with selected applications.

Course Content: Binary operations; Groups; Cyclic Groups; Symmetric Groups; Alternating Subgroups; Subgroups; Normal Subgroups; Simple Groups; Group Homomorphisms and Isomorphisms; Quotient Groups; Group Actions; Rings; Subrings; Integral Domains; Polynomial Rings; Ring Homomorphisms and Isomorphisms; Ideals; Prime and Maximal Ideals; Quotient Rings; Fields; Field Extensions; Finite Fields; Applications.
Grading: Your grade is determined by a syllabus quiz, paper-and-pencil homework assignments, a midterm, and a final. There may also be some extra credit based on participation in lecture.

The course will be graded as follows

- Syllabus Quiz 3%
- Homework 42%
- Midterm 25%
- Final 30%

Your grade in the course will not be harder than:
A-/A 90% - 100%, B-/B/B+ 80% - 89.9%, C-/C/C+ 70% - 79.9%, D-/D/D+ 60%-69.9%, F 0%-59.9%.

Course Specific Learning Outcomes: A successful student in Math 343 will be able to:

1. State the basic definitions of groups, subgroups and group homomorphisms.
2. Derive basic properties of groups, subgroups and group homomorphisms.
3. Calculate and use the order of elements in groups.
4. Identify normal subgroups and their connection with quotient groups.
5. Apply the First Isomorphism Theorem for groups.
6. State the basic definitions and derive basic properties of fields, rings, subrings and ring homomorphisms.
7. State the definition of an ideal and recognize its connection with quotient rings.

Student Conduct Code: Students are expected to be familiar with Oregon State University’s Expectations for Student Conduct. Please review these at the following web link:

http://studentlife.oregonstate.edu/code

Students With Disabilities: Accommodations for students with disabilities are determined and approved by Disability Access Services (DAS). If you, as a student, believe you are eligible for accommodations but have not obtained approval please contact DAS immediately at 541-737-4098 or at http://ds.oregonstate.edu. DAS notifies students and faculty members of approved academic accommodations and coordinates implementation of those accommodations. While not required, students and faculty members are encouraged to discuss details of the implementation of individual accommodations.
Syllabus Quiz: A short (canvas) quiz testing your knowledge of this syllabus will be available during weeks 0 and 1. It’s due on Sunday, Sept. 30th.

Exams: There will be one midterm and a cumulative final exam. Calculators and/or notes are NOT allowed. The final does NOT replace the midterm. Tests are not allowed to be made-up unless the circumstances are truly exceptional and contact requesting the accommodation is made PRIOR to the test.

- Midterm: Monday, Oct. 29th during our regularly scheduled lecture
- Final Exam: Wednesday, Dec. 5th, 12-1:50 PM

Homework: Each homework assignment will be available on the course web page at least one week before they are due in-class (due dates shown on tentative calendar). Late homework will not be accepted. If for some reason you have to miss a class on a day homework is due, you may either slide it under my office door (by 3 PM) or scan and e-mail me your assignment (by 3 PM).

Extra Credit – Lecture Participation: There may be up to a maximum of 5% of extra credit available in lecture. This will consist of up to 5 pop-discussion quizzes (at 1% each, where you can discuss the problems with your fellow students) given during some of the lectures. There may be less than 5 of these!

Course (Tentative) Calendar:

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<th>Week</th>
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<th>Tuesday</th>
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<td>Review (HW 3 due)</td>
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<td>Midterm</td>
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<td>Extension Fields (HW 5 due)</td>
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<td>Veterans Day</td>
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Notes: Syllabus Quiz due Sun. 9/30. Final on Wed. Dec. 5th at noon. Holidays in bold