

MAS 4301 – Abstract Algebra 1

Credit hours: 3

Textbook: Joseph A. Gallian, Contemporary Abstract Algebra , Eighth Edition, D.C. Heath and Co., 2012.

Prerequisites: grade of B or better in MAS 3300 or in MHF 3202, or a grade of C or better in MAS 4105

Grading System :

Exams: 2 midterms (20% each) – after Chapters 4 and 8, respectively; 1 final (40%) – cumulative

Weekly quizzes based upon the homework assignments (20%) – lowest score dropped

A: 90-100, B: 80-89, C: 65-79, D: 50-64, E: 0-49

Minus grades will not be used in this course.

Office hours: MWF, fifth period (or by appointment)

See Home Page for contact information (and more).

Brief Course Description

The purpose of this course is to introduce the student to the theory and some of the applications of the field of mathematics called abstract algebra. This will involve the study of the abstract structures called groups, rings and fields, which occur throughout mathematics and its modern application to the natural sciences. It will also involve the development of the student’s ability to recognize these structures in concrete instances.

Some important examples of applications of abstract algebra are symmetry groups in physics, chemistry and geometry, on the one hand, and coding theory in computer science and encryption, on the other, just to indicate briefly the vast range of uses of abstract algebra. A few of these applications will be illustrated during the course.

The course also serves as a continuation of the transition from the lower-division mathematics courses into a more abstract and structural approach to mathematics, which is, in fact, the real source of the power and utility of modern mathematics and distinguishes it from the mathematics of previous centuries.

The student will be expected to (continue to) develop the ability to reason through, and coherently and correctly write, proofs of theorems, as well as to develop relevant computational skills. An emphasis will be placed upon clarity of thought and expression.

This course will cover Chapters 1-15 of the above-mentioned textbook, if possible. If there is time remaining, we shall push further into the text.

Current Assignment

– This assignment is due on Wednesday, April 23. We are currently covering Chapter 14 of the text. The course meets fourth period, Monday, Wednesday, Friday, in Little 201.

NOTE: The final exam, covering Chapters 0 – 12 as well as material I added in lecture, will be held in Little 201 at 7:30 – 9:30 a.m. on Friday, May 2. There will be special pre-final office hours at 2:00 – 4:30 p.m. on Wednesday, April 30.

Previous Homework Assignments

- Assignment 1: ([HERE](#))
- Assignment 2: ([HERE](#))
- Assignment 3: ([HERE](#))
- Assignment 4: ([HERE](#))
- Assignment 5: ([HERE](#))
- Assignment 6: ([HERE](#))
- Assignment 7: ([HERE](#))
- Assignment 8: ([HERE](#))
- Assignment 9: ([HERE](#))

University Honor Code and Policy on Academic Honesty here

My policy on class attendance: I do not take a roll call, but it is inadvisable to miss class because I do not merely repeat nor do I examine only what is in the text. If you miss a class, it is your responsibility to find out what happened in class.

My policy on make-up work: There is no opportunity for make-up work afforded to you, unless your absence is an excused one according to the current definition of “excused absence” made by the university. If the latter definition applies to the situation, then you will come to me and we will work out a mutually convenient arrangement. Except in the case of a documented medical emergency, this must be done in advance.

University policy on the accommodation for disabled students:

My policy on make-up work: There is no opportunity for make-up work afforded to you, unless your absence is an excused one according to the current definition of “excused absence” made by the university. If the latter definition applies to the situation, then you will come to me and we will work out a mutually convenient arrangement. Except in the case of a documented medical emergency, this must be done in advance.

University policy on the accomodation for disabled students:

“Students requesting classroom accomodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor when requesting accomodation.”

An accomodation will then be worked out within the bounds of the possible with the aim of assuring that the disabled student will be able to benefit fully from the course.

Be sure to see:

- A brief History [of the concept of groups.](#)
- A brief History [of the development of group theory.](#)
- A brief History [of symmetry in chemistry, physics and mathematics, complete with additional links.](#)