

SYLLABUS

MAT 511-01 (6343)

Abstract Algebra I

August 28, 2013

College of Engineering, Forestry, and Natural Sciences

Dept. of Mathematics and Statistics

9:10 – 10:00 am, MWF, AMB 207

3 credit hours

Lecturer: Michael Falk

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Personal web page: <http://www.cefns.nau.edu/~falk>

Course web page: <http://www.cefns.nau.edu/~falk/classes/511/index511.html>

BBLearn page: <http://bblearn.nau.edu>

Office hours: MF 2:00 – 3:00, T 5:00 – 6:00, W 10:00 – 11:00, Th 4:00 – 5:00.

I'm also available to students at many other times during the week; drop by or make an appointment.

Virtual office hours: I encourage students to e-mail me with questions - my e-mail address is above. I will respond quickly.

Course web page, BBLearn, and e-mail: On the course web page I will post hints, solutions, and other useful and/or interesting information. In case I want to communicate with the entire class, I will express myself on the course web page. I will use the course BBLearn page to post grade information, exams and solutions. I will also send occasional e-mails to the entire class.

Texts: Joseph Rotman, *Introduction to the Theory of Groups: An Introduction*, 2nd ed. (1973), and I.N. Herstein, *Noncommutative Rings*.

Course Content: The fall semester will focus primarily on non-commutative algebraic structures. During the first 9-10 weeks we will study group theory, including isomorphism theorems, Sylow theorems, and classification of finite abelian groups. There will be a short sketch of Galois theory, followed by a study of solvable and nilpotent groups. There will be short sections on semi-direct products, matrix groups over finite fields, free groups, and infinite abelian groups. This material is contained in Chapters 1-6 (we will skip some portions of these chapters), and bits of Chapters 8 and 11 of the Rotman text. In the last five weeks we will study rings and modules and their role in the representation theory of finite groups. The primary goals are Maschke's Theorem, the Wedderburn-Artin theorem, and the irreducible decomposition of the regular representation of a finite group. This material is contained in Chapters 1, 2, and 5 of the Herstein text.

This is the first semester of a two-semester sequence. The second semester will focus on commutative algebra, including the theory of field extensions, Galois Theory, and elementary algebraic geometry or number theory.

Student Learning Outcomes: Students successfully completing this course will understand the basic notions, examples, and a selection of more advanced topics in group theory, commutative and noncommutative ring theory, will be able to solve problems and prove statements concerning these objects, and will be able to communicate their ideas orally and in writing in formal mathematical style.

Evaluation : There will be three midterm exams worth 140, 150, and 160 points respectively, a cumulative final worth 250 points, eight problem sets worth 25 points each, and less-formal exercise sets worth a total of 100 points. At the end of the semester, students' overall point totals (out of 1000 possible) are "curved" to arrive at letter grades for the course. This curve is based on my judgment of the performance of the individual and the class as a whole, relative to my experience with other students and classes at a similar level. It is unlikely that the distribution will meet the "straight scale" of 90/80/70/60, and it is also unlikely that a score under 50% will earn a C. Students may obtain information on class standing from me at any time. After each exam, I will produce a "provisional curve" to indicate to the class what grades I might give at various points during the semester, but these intermediate curves have no bearing on the final curve.

Course policies : Students are encouraged to work together and to seek assistance from the lecturer on all homework. If a group of students works together on a problem or exercise set, I would prefer that they hand in one paper as a result of their collaboration - all students involved should read, edit, and approve of the final document - rather than handing in several superficially different versions of the same set of solutions. Please don't work in groups larger than three or four. If you use resources such as web pages or other textbooks in a substantial way in your solutions, I have no objection, but these sources should be cited.

Late homework can be handed in any time during the semester for half credit; if handed before solutions are posted (typically the day after the due date), the student will receive 3/4 credit. Students may *use* posted solutions as they work on late homework, but must rewrite the solutions in their own words - copying *verbatim* from my solutions is plagiarism, and will not be granted any credit.

Exams will most likely be entirely or partially completed at home. Students may consult their own lecture notes and any textbooks or web pages, but may not discuss any part of the exam with any other person (in person or by chat or email), except for me. You are not to discuss the exam with any other student, whether they are taking the class or not. Enforcement is by the honor code - all students are expected to act with honesty and integrity, in fairness to all. If this is not possible, exams will be given in class. In case of confusing and/or incorrect problem statements, on exams or homework, students should e-mail or phone me and/or check their own e-mail and the course web page. Late exams will not be accepted, except in extremely compelling circumstances.

No cell phones!

Tentative exam dates :	Exam 1	Friday 9/27, due Tuesday 10/1 (6 pm)
	Exam 2	Friday 10/25, due Tuesday 10/29 (6 pm)
	Exam 3	Friday 11/22, due Tuesday 11/26 (6 pm)
	Final Exam	Tuesday 12/17, 7:30 - 9:30 am

NORTHERN ARIZONA UNIVERSITY
DEPARTMENT OF MATHEMATICS AND STATISTICS
UNIVERSITY AND DEPARTMENT POLICIES – FALL 2013

Course Prerequisites and Placement: Prior to enrollment in a course in the Department of Mathematics and Statistics a student must have completed the course prerequisites or have proper placement for the course. It is the students' responsibility to check that they are properly enrolled in a course and to drop the course if they are not. Failure to do so could result in not receiving credit for the course. The department may cancel students' registration in a course in which they are not properly enrolled. However, it is the student's responsibility to monitor their own enrollment.

Administrative Drops: An instructor may administratively drop from a course any student who is absent **one or more times** from class during the first week without contacting the instructor and receiving approval. Students who have not met all prerequisites for a course may be administratively dropped. However, it is the student's responsibility to monitor their own enrollment.

Class Attendance: Students are expected to assume full responsibility for class attendance and are accountable for work missed because of absences. Instructors are under no obligation to make special arrangements for students who have been absent unless such absence has been excused by a formal institutional excuse. Institutional excuses permit a student to be absent from classes to represent the University in athletics and extracurricular or academic activities. Institutional excuses must be hand-delivered to the instructor and arrangements made for the work missed prior to the planned absence from class.

Dropping/Auditing a Course: The last day you may drop/delete a course (*without the class appearing on your transcripts*) is **September 9, 2013**. The last day you may drop a course (and receive a **W**) is **October 30, 2013**. Academic policy requires that a student who never attended class or stopped attending class receive an **F** should the student fail to officially drop the course. The deadline to change from credit to audit or vice versa is **September 9, 2013**. Once a student has registered and completed a class as an auditor, the audit grade cannot be changed to a credit-earning grade. The grade of **AU** is awarded to auditors for satisfactory attendance. See the most recent *Academic Catalog* for more information at: <http://www4.nau.edu/aio/AcademicCatalog/academiccatalogs.htm>.

The Grade of Incomplete: A grade of **I** is given by an instructor only if a student is unable to finish a course due to extraordinary, unforeseeable circumstances, and the deadline to drop has passed. An incomplete is only given to a student who was passing the course with a grade of **C** or higher at the time the student was forced to stop attending. Before a grade of **I** can be given the student and instructor must complete the official department form indicating the work to be completed, as well as the date(s) by which the work must be completed. A grade of **I** not removed within a one-year period automatically reverts to a grade of **F**.

Final Examinations: Final examinations are required in all classes and must be given at the scheduled times and dates indicated in the university final exam schedule. An exception to the official final examination schedule can be made if a student is scheduled to take more than two examinations in one day. For more information, see the schedule at: <http://nau.edu/Registrar/Important-Dates/Fall-2013-Final-Exam-Schedule/>.

Portable electronic device policy: Cell phones, mp3 players and portable electronic communication devices, including but not limited to smart phones, cameras and recording devices, must be turned off and inaccessible during in-class tests. Any violation of this policy will be treated as academic dishonesty.

Other University Policies

Students are responsible for the following policies: Safe Environment, Students with Disabilities, Institutional Review Board, Academic Integrity, and Academic Contact Hour. A copy of these policies may be downloaded from the web site <http://www2.nau.edu/academicadmin/UCCPolicy/pleystmt.html>.