INSTRUCTOR
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COURSE
name: Introduction to Abstract Algebra (section 1-code 5562)
meeting time: MW at 4:00-5:15 p.m.
meeting place: LA5-151
text: Notes
materials: Calculator

prerequisites: The official prerequisite is Math 233, Math 247 and, at least one of Math 341 or Math 347. Realistically, we will need these prerequisites. More specifically, I will assume that your mathematical toolkit contains the following: induction (233), properties of functions (233) polynomial arithmetic (high school), matrix arithmetic (247), modular or clock arithmetic (233 or 341), the euclidean algorithm (high school or 341) and kuttaka or linear diophantine equations (341 or 310). Auxiliary notes on each of these topics have been placed in the website.

description: The course is an introduction to abstract algebra. The subject has some of the supreme patterns around, and hopefully we will all gain appreciation of the structures that allow us to appreciate the patterns. Basically we are trying to abstract arithmetic, and hence we will start by talking about the arithmetical operations. Three types of structures will become central to the course: groups, rings and fields, and we will dabble in all of them.

tentative syllabus: We will aim to cover the basic notions of groups, rings and fields, and their introductory theorems.

bibliography: There are many books written on abstract algebra. If you would like some historical perspective on the subject, an excellent reference is A History of Algebra by B. L. van der Waerden. Another excellent reference with historical undertones, and very relevant to our subject is, Numbers by Ebbinghaus et al. A textbook from the past is Topics in Algebra by Hernstein, but it is not very reader-friendly. Of the same flavor, but friendlier is Classical Abstract Algebra by Dean.
goals & objectives: This will be perhaps the most abstract mathematics class you will have in your undergraduate career, and so one of the chief goals is to get you to survive and tolerate the abstraction, and to even thrive in it. It is a rigorous course, so one of the main goals is to increase you ability to give mathematical proofs and arguments.

Mathematical Practices

1. Make sense of problems and persevere in solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.

ADMINISTRATIVE
timeliness Everything should be on time when assigned unless compelling reasons exist.

make-up policies: A make-up exam will be considered when you inform me ahead of time and have a reasonable excuse, or other very special circumstances.

last day to drop: Friday, April 17, 2015 is the last day to drop the course without the Dean’s signature. If you intend to drop, please secure my signature in plenty of time. Additionally, since this course has high enrollment, and some students have not been able to register, if you do not make a serious effort to succeed in the course, you will not be allowed to drop

Disability Please inform me as soon as possible, but certainly within two weeks from the start of the course, of any assistance you may need to deal with any university-verified disability/special need.

ASSESSMENT The main method of assessment will be three tests:

Tests

<table>
<thead>
<tr>
<th>First Midterm Exam</th>
<th>Wednesday February 25</th>
<th>21%</th>
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</thead>
<tbody>
<tr>
<td>Second Midterm</td>
<td>Wednesday April 8</td>
<td>22%</td>
</tr>
<tr>
<td>Final Exam</td>
<td>Monday May 11, 5:00-7:00</td>
<td>24%</td>
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Homework Every week, homework will be posted on the web with its due date. Homework should not be late. It will be picked up at the beginning of the class. Team work for the homework is acceptable (if not preferred). Usually, as in most of the courses I teach, a student who has done her/his homework performs adequately in the exams.

Quizzes Every Monday the class will start with a short quiz. No preparation is needed. There will be no make-ups for the quizzes, but the three lowest scores (including 0’s) will be dropped.

Research Project You will be a member of a team (of 2-3 students) and will choose to do research on a topic approved by me. Due May 4

Class Participation Class participation is mainly up to my discretion. The final grades will be assigned (approximately) traditionally.

Dates for Homework: Jan 28, Feb. 4, Feb. 11, Feb. 18, First Test, Mar. 4, Mar. 11, Mar. 18, Mar. 25, Second test, Apr. 15, Apr. 22, Apr. 29, May 4, Final