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COURSE INFORMATION  
MATH 2232 – Intro to Abstract Algebra  
Fall 2012

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The goal of this course is to introduce you to the basics of abstract algebra. We will learn the basic language of rings and groups, as well as some of the fundamental theorems that describe the structure of these objects. The other aim of this course is to teach you how to write mathematical proofs.

**Time:** MWF 11:30 - 12:30  
**Place:** Ryan Building 1045  
**Instructor:** Jennifer Biermann  
Office: RB 2018  
Office Hours: 1:30 - 2:30 W, Th  
**Textbook:** *Contemporary Abstract Algebra (8th Edition)* by J. Gallian  
**Email:** [jvbierma@lakeheadu.ca](mailto:jvbierma@lakeheadu.ca)  
**Web Page:** [jenniferbiermann.lakeheadu.ca/math2232.html](http://jenniferbiermann.lakeheadu.ca/math2232.html)

**Contact Information.** The best way to contact me is via email. Homework assignments, will be posted to the course website.

**Outline.** We will cover the following sections of Gallian's book:

- Chapter 0: Preliminaries
- Chapter 1: Intro to Groups
- Chapter 2: Groups
- Chapter 3: Finite groups; subgroups
- Chapter 6: Isomorphisms
- Chapter 7: Cosets and Lagrange's Theorem (first two sections)
- Chapter 9: Normal Subgroups and Factor Groups
- Chapter 10: Group Homomorphisms
- Chapter 12: Intro to Rings
- Chapter 13: Integral Domains
- Chapter 14: Ideal and Factor Rings
- Chapter 15: Ring Homomorphisms

The evaluation is composed of three components.

**1. Homework (40%)** There will be a homework assignment given out about every week and a half. The due date of the assignment will be given when the assignment is handed out. This information will also be available on the web. All of the homework questions (with some possible exceptions) will be taken from the textbook. The questions will be graded on either a 2 point or 5 point scale, depending on the type of question.

Type A These exercises review the concepts and definitions introduced in the section. These problems usually involve some sort of computation. Type A exercises will be marked out of 2 points as follows:

2 pts Near perfect or perfect solution. A near perfect solution is a solution that is correct up to the final stage with possible mistake or sign error at the last step.

1 pt The solution shows some of the needed ideas, but fails to have the final solution.

0 pts Little or no progress is made toward the solution.

Type B These exercise usually involve proving statements using the results and concepts of the corresponding section. The majority of problems assigned will be Type B exercises. These exercises will also be graded on how the proof has been written. These problems will be graded out of 5 points as follows:

5 pts A correct solution and a well written proof.

- 4 pts Most of the required ingredients are present, but there are a few technical problems with the solution.
- 3 pts Some of the needed ideas are present. However, the solution either lacks the final conclusion or has some problems in the exposition.
- 2 pts The proof has at most one or two of the needed ideas and/or the proof is poorly written.
- 1 pt An attempt at the solution has been made, but there is a major flaw in the logic of the proof, or the proof is not well written.
- 0 pts Little or no progress is made toward the solution.

An exercise that receives a mark of 3 or less can be rewritten and submitted for a new grade. A re-marked exercise will receive a maximum of 4 points. For example, if on your first submission of an exercise you receive 2 points out of 5, you can rewrite the exercise (using the suggestions I gave you) to attain a higher mark. However, the maximum you can now receive on this exercise is 4 out of 5. A rewrite must be done within two weeks of the assignment being handed back and at most one time for any specific problem. When handing in a rewritten assignment, you must include the original assignment so I can compare the two, and more importantly, up-date your mark!

**Homework Presentation:** Since an important part of this course is learning how to write proofs, I am going to be very picky about your write up. In particular, you must use the following guidelines when writing your solutions:

- Always write out the question before giving the proof or answer.
- Write on every other line of your paper. This will give me plenty of room to write comments.
- Homework **must always be stapled** together, and must include your name and homework assignment number.

Homework will have 10 points deducted for every day (weekday) that it is late, and if any of the above style guidelines are not met.

**3. Exams (Midterm 25%, Final Exam 35%)** There will be one test and a final exam. A detailed handout describing the test (resp. exam) will be given near the test (resp. exam) date.

**Class Policies** Although attendance is not mandatory, I would appreciate the fact that you show up on time if you do decide to come to class. It is your responsibility to make up missing material. Also, please turn off your phone while in class.

Exams and tests must be taken on the date assigned.

### Important Dates

Sept. 10, 2012 - First day of class

Oct. 4, 2012 - First Midterm Exam

Oct. 8, 2012 - Thanksgiving (no classes)

Nov. 2, 2012 - Last day to withdraw without penalty

Nov. 9, 2012- Second Midterm Exam

Dec. 3, 2012- Last day of class

Dec. 6 - 17, 2012 - Final Exams