Abstract Algebra I

MATH 341

Syllabus

Time: 10:30-11:20 MWF
Classroom: Alter 219
Instructor: Dr. Dena Morton
Office: Hinkle 108
Phone: x3674 (Note: I do not check my voice mail very often.)
Office Hours: By appointment (including some phone appointments at night) and
  - Monday 9:30-10:30, Wednesday 9:30-10:30, 1:30-2:30, Friday 10:00-10:30, 1:30-2:30
  
e-mail: morton@xavier.edu
Note: this is the best way to reach me – I check my e-mail on a regular basis.
Web Page: http://cerebro.xu.edu/~morton/aclasses.html
  Note: I update my webpage every day – all homework assignments are always posted online. Also, check out the beautiful mathematical pictures!
Prerequisites: MATH 340 (Abstract Algebra I).

Purpose and Content: This is a continuation of MATH 340. In this course you will be introduced to rings and fields, and special topics as time allows.

Texts: Contemporary Abstract Algebra, seventh edition by Joseph A. Gallian

Homework: Problem sets will be assigned weekly. Each student will be allowed to turn in one late homework set during the semester without penalty (to be turned in by the next class period).

Class Activities: Classes will consist of group activities, discussion, individual activities, and lectures.

Quizzes: Weekly quizzes on algebraic definitions and examples will be given on Wednesdays. I will grade these on a 10-point scale. The lowest quiz score will be dropped, so makeup quizzes will not be given. Quizzes will not be given during exam weeks. Note: These quizzes are invaluable - if you don’t know the definitions, you cannot possibly expect to do the mathematics.

Exams: There will be three exams given throughout the semester, each consuming an entire class period and also having a take-home component. There will also be a comprehensive final exam. If you must miss an exam for religious or academic reasons, or in cases of illness or emergency, you must submit a written excuse. A makeup may be scheduled -- this will be decided on a case-by-case basis.

Grading:
  - Weekly quiz performance: 7%
  - Three exams: 12% each
  - Weekly graded problem sets: 30%
  - Research paper: 7%
  - Final exam (cumulative): 20%

Each exam will be curved separately and assigned a number grade between 0.0 (the lowest possible F) and 5.0 (the highest possible A). I will announce the cutoffs when returning the exam. If, for example, the cutoff for an A is 87 and the cutoff for a B is 71 and you get an 83, then the number grade corresponding to your 83 would be a 3.75 (B corresponds to 3.0 and you are 12/16=.75 of the way to the next cutoff). The homework and quizzes will be treated similarly. The total course grade may be curved further (that is, a 3.9 might result in an A or A- in the course), but the resulting curve will never lower your grade (that is, a 4.1 would always result in at least an A-
in the course. I reserve the right to assign a grade of “F” to any student who earns less than 50% on the final exam.

Important Dates (Exams are Tentatively Scheduled):

<table>
<thead>
<tr>
<th>Date</th>
<th>Event</th>
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<tbody>
<tr>
<td>Monday, Jan. 11</td>
<td>First day of class</td>
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<tr>
<td>Monday, Jan. 18</td>
<td>MLK Holiday (no classes)</td>
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<tr>
<td>Wednesday, Feb. 10</td>
<td>Exam I</td>
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<tr>
<td>Monday, Mar. 1 – Friday, Mar. 5</td>
<td>Spring Break (no classes)</td>
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<tr>
<td>Wednesday, March 17</td>
<td>Exam II</td>
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<tr>
<td>Friday, Apr. 2 – Monday, Apr. 5</td>
<td>Easter Break (no classes)</td>
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<tr>
<td>Monday, April 12</td>
<td>Last day to withdraw</td>
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<tr>
<td>Wednesday, Apr. 21</td>
<td>Exam III</td>
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<tr>
<td>Friday, Apr. 30</td>
<td>Last day of classes</td>
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<tr>
<td>Monday, May 3</td>
<td>Study Day (no classes – we will have a review session)</td>
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<tr>
<td>10:30-12:20 Wednesday, May 5</td>
<td>Final Exam</td>
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Attendance: Class attendance is crucial. Lectures include the introduction and explanation of new topics, explorations of proofs, and solutions of discrete mathematics problems. Class notes are to be used in conjunction with the text, in order to elicit a fuller understanding of discrete mathematics. Please be courteous and come to class on time!

University policies on attendance are stated on p.45 of the undergraduate catalog.

Missed Classes: If you must miss a class due to illness or an emergency, you must first get a copy of the notes from one of your classmates. (If you do not know anyone in the class, I will help you contact someone to get notes.) Review the missed notes, and write detailed questions as you are reading them. I will be happy to answer all of your questions (as many as you would like to ask!), but I cannot re-lecture for you. As noted above, quizzes cannot be made up.

Group Work: Working in a group can be beneficial for everyone involved, provided that you do not abuse the privilege. Make sure that everyone in your group is making a contribution. Do not copy answers from one another, as this will only backfire against you come test-time and is also cheating! Instead, let concepts gel after group discussion, and then write up the solutions by yourself.

Academic Honesty: You are expected to conduct yourself with integrity in this course. Cheating will be dealt with as harshly as University regulations permit; measures will be taken during exams to prevent cheating. Students are directed to p. 50 of the undergraduate bulletin for further information. Note: talking during an exam (to anyone other than me) is grounds for a failing grade on the exam. Using (uncited) web-pages to write your critique is cheating and plagiarizing! The best critiques are written from your own experience.

Calculators: You will need some sort of calculator – a TI-83 is suggested. Cell phone calculators are not allowed. You may not have any programs on your calculator. If you have old programs, you must transfer them to a disc and reset all calculator memories at the beginning of exams.

Cell phones: Please turn all cell phones off during class (no texting either, please). Cell phones must be away during exams.

How to Do Well in this Course: Come to class! Come visit me during office hours! Read the books and articles! Try the problems! Smile! Study hard! Read your class notes! Make sure you keep up with the material in class! Review your class notes! Don’t Panic! Enjoy! Most important of
all, if you feel that you are falling behind, or that you do not understand a certain topic, or if you 
would just like to discuss a mathematical idea (or anything else), come to visit me in my office. 
That's why I am here!😊

**Possible Topics for Final Papers**

Finite Simple Groups  
Algebraic Coding Theory  
Frieze groups and Crystallographic Groups  
Quasigroups and Loops  
Public Key Cryptography  
Cayley Digraphs of Groups  
Boolean Algebras  
Constructable Numbers and geometric constructions  
Sylow Theorems  
Noetherian rings  
Representation theory  
Tensor products  
Frobenius Algebras  
Modules over rings