

# MATH 4107 SYLLABUS

FALL 2002

Course Number: Math 4107 A1

Course Name: Introduction to Abstract Algebra I

Lecture Time: MWF 11:05–11:55 a.m.

Lecture Room: Skiles 256

Instructor: Dr. Christopher Heil  
Office: Skiles 260  
Office Phone: 404-894-9231  
Email Address: [heil@math.gatech.edu](mailto:heil@math.gatech.edu)

Office Hours: TBA and by appointment

Contacting me: I encourage you to contact me at any time by email. I try to check email evenings and weekends and to respond to questions quickly. Please don't be afraid to set up other appointment times if you are having trouble getting in touch with me.

Textbook: *Algebra: Abstract and Concrete*, SECOND EDITION,  
by Frederick M. Goodman

Material: Selected from Chapters 1–7

Prerequisites: Math 2406 (Abstract Vector Spaces)

**Prerequisites.** This is a *proof-based* course on groups, rings, and fields. One of the main goals of the prerequisite course (MATH 2406) is to teach you proofs and proof-writing. If you haven't taken that course or an equivalent course where you learned to write proofs, you may find it quite difficult to jump into the abstract setting of this course. Unlike calculus, differential equations, etc., there are no *formulas*, only *concepts*, here, and the *proofs* of those concepts—the reasons *why* things are true.

**Grading.** We will have between 5 and 7 homework assignments, two in-class exams, and one final exam. With 6 homeworks, points would be scored as follows.

6 Homeworks	15 points each
Exam I	30 points
Exam II	30 points
<u>Final Exam</u>	<u>50 points</u>
TOTAL	200 points

Letter grades will be based on your accumulated points at the end of the quarter, according to standard 90%, 80%, 70%, 60% cutoffs (although I may adjust the cutoffs downward at the end of the quarter, depending on class distribution):

180–200	A
160–179	B
140–159	C
120–139	D
0–119	F

At the end of the course, I'll evaluate the class distribution and decide if a curve is needed. I'll only curve *down* from the above cutoffs, not up!

If we have more or fewer homeworks, the total number of points possible and the corresponding cutoffs will be adjusted accordingly.

**Homework.** Homeworks will be assigned approximately once every two weeks, and will usually be due one week after they are handed out. Homeworks will consist of problems selected from the book or problems that I make up. A subset of these will be selected for grading.

You are allowed (and encouraged) to work together with other students on the homework, as long as you each independently write up your own solutions. You are also allowed (and encouraged) to ask me questions, although you should try to think about the problems before asking. I strongly encourage you to work extra problems from the book on your own.

**Exams.** The tentative dates for the exams are:

Exam I	Monday, September 23 (in class)
Exam II	Friday, November 8 (in class)
Final Exam	Tuesday, December 10, 2:50–5:40 p.m.

The exams are closed-book and closed-notes, except that you will be allowed to bring one note sheet to each exam. The final is comprehensive.

Makeup exams are given only in extraordinary circumstances.

# MATH 4107 SYLLABUS

SPRING 2007

- Course Number: Math 4107 AU, AG
- Course Name: Introduction to Abstract Algebra I
- Lecture Time: MWF 12:05–12:55 p.m.
- Lecture Room: Skiles 243
- Instructor: Dr. Christopher Heil  
Office: Skiles 260  
Office Phone: 404-894-9231  
Email Address: [heil@math.gatech.edu](mailto:heil@math.gatech.edu)
- Course Web Page: <http://www.math.gatech.edu/~heil>
- Office Hours: MWF 10-11 and by appointment
- Contacting me: I encourage you to contact me by email. I try to check email daily and to respond to questions quickly. Please don't be afraid to set up other appointment times if you are having trouble getting in touch with me.
- Textbook: I. N. Herstein, Abstract Algebra, Third Edition
- Material: Chapter 2: Groups  
Chapter 3: The Symmetric Group  
Chapter 4: Ring Theory  
Chapter 5: Fields
- Prerequisites: Math 2406 (Abstract Vector Spaces)

**Prerequisites.** This is a *proof-based* course on groups, rings, and fields. One of the main goals of the prerequisite course (MATH 2406) is to teach you proofs and proof-writing. If you haven't taken that course or an equivalent course where you learned to write proofs, you may find it quite difficult to jump into the abstract setting of this course. Unlike calculus, differential equations, etc., there are no *formulas*, only *concepts*, here, and the *proofs* of those concepts—the reasons *why* things are true.

**Academic Dishonesty.** All students are expected to comply with the Georgia Tech Honor Code. Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. The institute honor code is available at

[http://www.deanofstudents.gatech.edu/integrity/policies/honor\\_code.php](http://www.deanofstudents.gatech.edu/integrity/policies/honor_code.php)

**Grading.** We will have 5 homework assignments, two in-class exams, and one final exam, scored as follows.

5 Homeworks	25 points each
Exam 1	35 points
Exam 2	35 points
<u>Final Exam</u>	<u>55 points</u>
TOTAL	250 points

Letter grades will be based on your accumulated points at the end of the semester, according to standard 90%, 80%, 70%, 60% cutoffs (although I may adjust the cutoffs downward at the end of the semester, depending on class distribution):

225–250	A
200–224	B
175–199	C
150–174	D
0–149	F

At the end of the course, I'll evaluate the class distribution and decide if a curve is needed. I'll only curve *down* from the above cutoffs, not up!

**Homework.** Homeworks will be assigned approximately once every two weeks, and will usually be due one week after they are handed out. Homeworks will consist of problems selected from the book or problems that I make up. A subset of these will be selected for grading.

Homeworks should be written on the front side of the page only, and must be stapled. LATE HOMEWORKS WILL NOT BE ACCEPTED.

You are allowed (and encouraged) to work together with other students on the homework, as long as you each INDEPENDENTLY WRITE UP YOUR OWN SOLUTIONS. You are also allowed (and encouraged) to ask me questions, although you should try to think about the problems before asking. I strongly encourage you to work extra problems from the book on your own.

**Exams.** The tentative dates for the exams are:

Exam 1	Friday, February 9 (in class)
Exam 2	Friday, March 9 (in class)
Final Exam	Friday, May 4, 8:00–10:50 a.m.

The exams are closed-book and closed-notes, except that you will be allowed to bring one note sheet to each exam. The final is comprehensive.

Makeup exams are given only in extraordinary circumstances.

# MATH 4107 SYLLABUS

SPRING 2010

- Course Number: Math 4107 AU, AG
- Course Name: Introduction to Abstract Algebra I
- Lecture Time: MWF 12:05–12:55 p.m.
- Lecture Room: Skiles 243
- Instructor: Dr. Christopher Heil  
Office: Skiles 109  
Office Phone: 404-894-9231  
Email Address: [heil@math.gatech.edu](mailto:heil@math.gatech.edu)
- Course Web Page: <http://www.math.gatech.edu/~heil>
- Office Hours: MF 1-2 and by appointment
- Contacting me: I encourage you to contact me by email. I try to check email daily and to respond to questions quickly. Please don't be afraid to set up other appointment times if you are having trouble getting in touch with me.
- Textbook: I. N. Herstein, Abstract Algebra, Third Edition
- Material: Chapter 2: Groups  
Chapter 3: The Symmetric Group  
Chapter 4: Ring Theory  
Chapter 5: Fields
- Prerequisites: Math 2406 (Abstract Vector Spaces)

**Prerequisites.** This is a *proof-based* course on groups, rings, and fields. One of the main goals of the prerequisite course (MATH 2406) is to teach you proofs and proof-writing. If you haven't taken that course or an equivalent course where you learned to write proofs, you may find it quite difficult to jump into the abstract setting of this course. Unlike calculus, differential equations, etc., there are no *formulas*, only *concepts*, here, and the *proofs* of those concepts—the reasons *why* things are true.

**Academic Dishonesty.** All students are expected to comply with the Georgia Tech Honor Code. Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students. The institute honor code is available at

<http://www.honor.gatech.edu>

**Grading.** We will have six homework assignments, two in-class exams, and a final exam.

6 Homeworks	25 points each
Exam 1	50 points
Exam 2	50 points
<u>Final Exam</u>	<u>100 points</u>
TOTAL	350 points

Letter grades will be based on your accumulated points at the end of the semester, according to 90%, 80%, 70%, 60% cutoffs (although I may adjust the cutoffs downward at the end of the semester, depending on class distribution):

315–350	A
280–314	B
245–279	C
210–244	D
0–209	F

At the end of the course, I'll evaluate the class distribution and decide if a curve is needed. I'll only curve *down* from the above cutoffs, not up.

**Homework.** Homeworks will consist of problems selected from the book or problems that I make up. Assignments will be posted on the course web site. A subset of the problems will be selected for grading.

Homeworks should be written on the front side of the page only, and must be stapled. LATE HOMEWORKS WILL NOT BE ACCEPTED.

You are allowed (and encouraged) to work together with other students on the homework, as long as you each INDEPENDENTLY WRITE UP YOUR OWN SOLUTIONS. You are also allowed (and encouraged) to ask me questions, although you should try to think about the problems before asking. I strongly encourage you to work extra problems from the book on your own.

**Exams.** The tentative dates for the exams are:

Exam 1	Friday, February 19 (in class)
Exam 2	Friday, March 19 (in class)
Final Exam	11:30 a.m.–2:20 p.m., Monday, May 3

The exams are closed-book and closed-notes, except that you will be allowed to bring one 8.5x11 sheet of notes (you can write on both sides) to each exam. The final is comprehensive.

Makeup exams are given only in extraordinary circumstances.

# Syllabus for Math 4107, Abstract Algebra

August 18, 2009

**Instructor:** Ernie Croot

**email:** [ecroot@math.gatech.edu/~ecroot](mailto:ecroot@math.gatech.edu/~ecroot)

Please resist the urge to email me unless it is absolutely necessary.

**Course Webpage:** [www.math.gatech.edu/~ecroot](http://www.math.gatech.edu/~ecroot) Click on the Math 4107 link from the main page.

**Office:** 103 Skiles

**Office Hours:** Monday 2:00 to 3:00, Wednesday 3:00-4:00.

**Class Meeting Times and Place:** TR 4:35-5:55 in Skiles 169.

**Textbook:** Herstein's *Topics in Algebra*

**Grade:** 20% for each of the first two midterms, 30% for homework, and 30% for the final.

**Homeworks:** Homeworks will be collected once every two weeks.

**Course Material:** In this course you will learn about the basic structures of higher mathematics, such as groups, rings, and fields. Much of what you will learn will be language, although there are a few very important theorems which we will encounter and prove, such as Lagrange's theorem, isomorphism theorems, unique factorization of the integers, Euclidean algorithm, PID implies UFD, fundamental theorem of finitely generated abelian groups, and so on.

The material in this course is significantly more abstract than what you are used to dealing with, and for many of you it will pose a serious challenge. Thus, I encourage you to keep up with homeworks, attend office hours, and read the text carefully.

# Course Syllabus

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**Professor:** Dr. Christine Heitsch

**Office:** Skiles 226

**Phone:** (404) 894 - 4758

**Email:** heitsch@math.gatech.edu

**Webpage:** <http://www.math.gatech.edu/~heitsch>

**Office Hours:** Monday 3:30 – 4:30, Tuesday and Thursday 1:30 – 2pm. If you need to see me at another time, please email me to set up an appointment.

**Lectures:** Tues, Thurs 12:05 – 1:25 in Skiles 240.

**Textbook:** I. N. Herstein, *Abstract Algebra*, Third edition, John Wiley & Sons, Inc., 1995.

**Course Description:** “This course develops in the theme of ‘Arithmetic congruence, and abstract algebraic structures.’ There will be a very strong emphasis on theory and proofs.”

**Prerequisites:** Math 2406 (Abstract Vector Spaces) or equivalent.

**Course Topics:** Groups (Chapt. 2); The Symmetric Group (Chapt. 3); Ring Theory (Chapt. 4); Fields (Chapt. 5);

**Grading Scheme:** Grades will be calculated according to the following distribution:

30% Final Exam

40% Two Midterm Exams (20% + 20%)

30% Homework

Grades will be assigned on the standard scale:

**A** 90 or higher    **B** 80 – 89    **C** 70 – 79    **D** 60 – 69    **F** Below 60

On an individual basis, significant improvement over the semester will be taken into account. The overall class distribution will also be carefully considered.

**Final Exam:** The final exam is scheduled for Friday, December 13th, from 8:00AM - 10:50 AM. The exam will be cumulative and count for 30% of the final grade.

**Midterm Exams:** There will be two in-class exams, each counting for 20% of the final grade, for a total of 40%. The exams will be closed book, closed notes, no calculator, individual tests. The **tentative** exam dates are:

**Midterm 1** Tuesday, September 30th

**Midterm 2** Thursday, October 30th

Exam dates will be confirmed at least a week in advance.



**Homework:** Homework will be assigned approximately every two weeks, and due one week later at the beginning of class. **Late homework will not be accepted.**

A subset of the homework problems will be selected for grading. Assignments must be neatly and clearly written in complete, correct English sentences. Homework must be written on the front side of the page only, and multiple pages must be stapled together. Illegible and/or unintelligible solutions will receive no credit.

Collaboration is allowed (and even encouraged) when working on homework problems. However, **each student must write-up and submit an independent solution in his/her own words.**

**Attendance:** Regular attendance is expected. Exceptions will be accommodated only for valid, documented reasons including (1) official representation of the Institute and (2) medical emergencies. Note that makeup exams will be given only under extraordinary circumstances.

**Exceptions:** If you know that you will not be able to meet the requirements of the class as stated, you must contact me within the first two weeks of class.

**Academic Integrity:** Students are reminded of the obligations and expectations associated with the Georgia Tech *Academic Honor Code* and *Student Code of Conduct*, available online at: <http://www.deanofstudents.gatech.edu/Honor/index.html> and <http://www.deanofstudents.gatech.edu/integrity/policies.php>. Any violations must be reported to directly to the Dean of Students.

**Practice Problems:** In addition to the homework assignments, numerous “practice problems” from the book will be suggested. You are strongly encouraged to work these problems and other additional exercises on your own and/or with other students to master the course material.

**Additional Resources:**

- T-Square — <http://t-square.gatech.edu>
- 4107 webpage — <http://www.math.gatech.edu/~heitsch/4107.html>
- “Writing Proofs” by Prof. Chris Heil, Georgia Tech — <http://www.math.gatech.edu/~heil/handouts/proofs.pdf>
- “How to write proofs: a quick guide” by Dr. Eugenia Cheng, U Sheffield — <http://cheng.staff.shef.ac.uk/proofguide/>

**Updates:** This syllabus is subject to modification. Any changes will be announced in class and posted on the course website.

Georgia Institute of Technology  
Math 4107 - Abstract Algebra I – Fall 2011

<u>Room</u>	<u>Days/Time</u>
Skiles 170	MWF 2:05–2:55 pm

**Instructor:** Dr. Josephine Yu

**Office Hours:** MWF 11am–noon and by appointment

**Office:** Skiles 223

**Email:** [jyu@math.gatech.edu](mailto:jyu@math.gatech.edu)

**Phone:** (404)894-4754

**Webpage:** <http://people.math.gatech.edu/~jyu67/teaching/2011Fall4107/> and [t-square](#).

**Textbook:** *Topics in Algebra* 2nd ed. by I. N. Herstein. I have requested some copies to be on reserve at the library.

**Topics:** Group theory and ring theory (Chapter 1–3 of the textbook).

**Homework:** There will be weekly homework assignments posted on the course webpage. You are encouraged to discuss homework problems and solutions with each other and to come to office hours, but you must write up your own solutions independently, i.e. you must not be looking at other people's solutions while you are writing yours. Write in complete sentences clearly and concisely. You will not receive credit if the grader does not understand your writing. *No late homework is accepted.*

**Exams:** There will be 3 in-class exams and a comprehensive final exam. The tentative dates for the exams are:

Exam 1	Oct 7
Exam 2	Nov 4
Exam 3	Dec 2

**Attendance:** Regular attendance and *active participation* in class is expected from every student. The student who misses a class meeting is responsible for everything that is covered in class.

**Make-up exams:** In the event of an absence due to travel representing Georgia Tech, such as an intercollegiate sports competition, you must notify me at least two weeks in advance to arrange an early test or other alternative. If you miss an exam due to family or medical emergency, please bring me a note from the Office of the Dean of Students.

**Grading:** The usual ten-point scale will be used (A: 90-100%, B: 80-89%, C: 70-79%, D: 60-69%, F: 0-59%). If necessary, I may “curve down” (but not up) to arrive at a standard grade distribution. The following weighting is used to compute the grades:

Homework	20 %
Exam 1	20 %
Exam 2	20 %
Exam 3	20 %
Final	20 %

**Learning Disabilities:** It is the right of any student with a certified learning disability to request necessary accommodation. Such requests must be made well in advance of the time that the accommodation is required. A letter of documentation from the **ADAPTS** office must be presented at the time of any request. Please make an individual appointment with me so that we can discuss your needs.

**Academic Honesty:** All students must be aware of their individual responsibilities under the **Georgia Tech Academic Honor Code**, which will be strictly adhered to in this class. Any evidence of cheating or other violations of the Georgia Tech Honor Code will be submitted directly to the Dean of Students.

**Important Dates for Fall 2010:**

Aug 22	First day of classes
Aug 26	Last day to register
Sep 5	Labor Day. No class.
Oct 14	Last day to drop individual courses with a grade of “W” by 4:00 pm ET
Oct 17-18	Student recess. No class.
Oct 30	Last day to withdraw from school with “W” grades in all courses by 4:00 pm ET
Nov 24-25	Thanksgiving. No class.
Dec 9	Last day of classes
Dec 12	Final Exam (11:30am – 2:20pm)