

# MA3823 Syllabus

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**Office hours:** 9-12 M, 2-4 T  
... or just stop by at any time.

MA 3823 – B01, B Term 2012  
Group Theory  
**Text:** “Contemporary Abstract Algebra”  
by J. A. Gallian (8<sup>th</sup> ed.)

**Meetings:** 8-8:50 MTRF, SH202

The goal of this course is to introduce the student to the basic concepts and techniques of modern or abstract algebra. Setting the important subject of ring theory aside to be addressed in another course (MA 3825), we explore groups. Groups constitute a simple generalization of familiar structures such as number systems under addition and geometric objects under symmetry. Due to this great generality, group theory has a fantastic array of applications and exhibits connections to almost every area of mathematics. Groups arise in chemistry, physics, computer science and more. But our primary goal here is to develop our skills in rigorous mathematical development, being ready to justify all claims with rigorous proofs. At the end of the course, we will have a chance to see the homomorphism used as a proof technique.

We will study as a team. Students are encouraged to collaborate ethically on assignments. (For example, direct copying is forbidden and every member of a discussion group must make significant contributions or will not be welcome in the future.) Class participation will be a large part of your grade. All students are expected to come to class having completed the assigned reading and ready to answer questions verbally or to present solutions at the blackboard. Nevertheless, it is expected that most of the learning will occur outside of normal class time.

## TERM SCHEDULE

Here is a rough outline of what I expect us to cover in the 28 class meetings:

|                    |   |                               |
|--------------------|---|-------------------------------|
| Oct. 23 to Oct. 30 | <i>Introduction</i>                       | Chapters 0 – 2                |
| Nov. 1 to Nov. 9   | <i>Finite Groups</i>                      | Chaps. 3 – 5                  |
| Nov. 12 to Nov. 20 | <i>Examples and Operations on Groups</i>  | Chaps. 8, 11, parts of 25, 26 |
| Nov. 26 to Dec. 7  | <i>Homomorphisms and Structure</i>        | Chaps. 6, 7, 9, 10            |
| Dec. 10 to Dec. 13 | <i>Additional Topics (as time allows)</i> | Chaps. 24 – 30                |

## GRADES

**A:** 100 % – 88 %;    **B:** 87.99 % – 74 %;    **C:** 73.99 % – 60 %

## **GRADING SCHEME**

|   |      |
|---|------|
| Homework (best 4 out of 5 assignments): | 20 % |
| Classroom Participation:                | 20 % |
| Mid-Term Exam (Tue. Nov. 20):           | 20 % |
| Final Exam (Thur. Dec. 13):             | 40 % |

## **ASSIGNMENTS**

Assignments will be due (in my mailbox in Room SH108) at 4:30 pm; due dates will be given when problem sets are distributed. Due dates will be given when problem sets are distributed. (As a rough guide, let us expect homework due on Fridays, Nov. 2, 9, 16, 30, and Dec. 7.)

## **TESTS**

There will be one midterm exam on Tuesday, November 20 and a final exam on Thursday, December 13, in class. The final exam will weigh twice as much as the midterm.

## **PARTICIPATION**

Each student is expected to actively engage in group discussion and problem solving, to present solutions and text material during class period when called upon. Moreover, all students are expected to participate daily by asking questions and answering the questions of the day's speaker. At the end of the course, each student will be assigned a grade for this component based on the instructor's judgment.

## **ACADEMIC HONESTY**

Each student is expected to familiarize him/herself with WPI's Academic Honesty policies which can be found at

<http://www.wpi.edu/offices/policies/honesty>

All acts of fabrication, plagiarism, cheating, and facilitation will be prosecuted according to the university's policy. If you are ever unsure as to whether your intended actions are considered academically honest or not, please see Professor Martin.

## **STUDENTS WITH DISABILITIES**

If you need course adaptations or accommodations because of a disability, or if you have information to share with me about anything that will impact your performance or participation, please make an appointment with me as soon as possible to discuss how these specifically apply to any aspect of this course. If you have not already done so, students with disabilities who believe that they may need accommodations in this class are encouraged to contact the Office of Disability Services (ODS) as soon as possible to ensure that such accommodations are implemented in a timely fashion. This office is located in the West St. House (157 West St), (508) 831-4908.

## **INFORMATION ON THE WEB**

The course web page is

<http://www.wpi.edu/~martin/TEACHING/current.html>