

**Text** We will be using *Contemporary Abstract Algebra* (Fifth Edition) by Joseph A. Gallian. (Note that the book is now in a Sixth Edition, but we will still be using the Fifth Edition.) We will cover material from Chapters 12 through 23, and 32 — see the attached **tentative** schedule for the exact sections covered. A suggested optional text is *Galois Theory* (Second Edition) by Joseph Rotman (ISBN: 0387985417, \$45 new, \$35 used).

**Home Page** Start at <http://buzzard.ups.edu/courses.html> to locate the WWW page for this course.

**Office Hours** My office is Thompson 321G; the telephone number is 879–3564. Making appointments or simple, non-mathematical questions can be handled via electronic mail — my address is [beezer@ups.edu](mailto:beezer@ups.edu). Office hours will be 11:00–11:50 on Monday, Wednesday and Friday. I will always be available during these times on a first-come, first-served basis. If these times are not convenient, please do not hesitate to make an appointment with me for another time. You are also welcome to drop by my office without an appointment at any time that I am in (good times to try are 2 P.M. to 4 P.M. on Monday, Wednesday and Friday, and most all of Tuesday). Office hours are your opportunity to receive extra help or clarification on material from class, or to discuss any other aspect of the course.

**Homework** Homework will be assigned for each chapter (see list below), but will not be collected. (Some suggested problems from Rotman are also listed.) Of course, you are not limited to working *just* these assigned problems. Once per chapter we will have a problem session where we can discuss these problems. It is your responsibility to be certain that you are learning from the homework exercises. The best ways to do this are to work the problems diligently when assigned and to participate in the classroom discussion. If at this point you are still unsure about a problem, then a visit to my office is in order. Making a consistent effort outside of the classroom is the easiest way to do well in this course.

Mathematics not only demands straight thinking, it grants the student the satisfaction of knowing when he or she is thinking straight. — D. Jackson

Mathematics is not a spectator sport. — Anonymous

I hear, I forget.

I see, I remember.

I do, I understand.

— Chinese Proverb

An education is not received. It is achieved.

— Anonymous

**Reading Questions** Once you have read the chapter *prior* to our in-class discussion, submit your responses to the reading questions via electronic mail as follows. Do **not** send your responses to my regular email address ([beezer@ups.edu](mailto:beezer@ups.edu)), but instead use the address I will announce in class. Your responses are due at 9 PM the night before we begin discussing a new chapter (these dates are noted on the attached tentative schedule), and will not be accepted late. Use a subject that is **exactly** like “RQ-X,” where X is the number of the chapter. So for example, your first response will be titled: RQ-12. In the first line of your response, please put your real name, then answer the questions in order.

If a question asks for a computation, you can just give the answer, no need to show your work in the email. If the question is a yes/no answer, or asks “Why?” then give an explanation. Do your best with mathematical notation, but do not fret if it is a bit sloppy or weird, I can usually decipher any reasonable attempt. Please send *only straight text* — no attachments, no Word files, no graphics, no HTML if you can help it. Please pay careful attention to these procedures and deadlines.

**Quizzes** There will be seven one-hour quizzes — see the attached sheet for tentative dates. These will occur on alternate Tuesdays and all but one will cover the content of two chapters. The lowest of your quiz scores will be dropped. The comprehensive final exam will be given at 8 AM on Wednesday, May 10. The final exam cannot be given at any other time, so be certain that you do not make any travel plans that conflict, and also be aware that I will allow you to work longer on the final exam than just the two-hour scheduled block of time.

**Projects** You will participate in one research project on a topic related to the material in this course (interpreting this to mean both Math 433 and Math 434) as a way to demonstrate your progression towards becoming an independent scholar of mathematics. You may work in a group of size  $n$ ,  $1 \leq n \leq 3$ . My expectations for the quality and quantity of your work will be  $\alpha n$ , where  $\alpha$  is some indeterminable constant of proportionality. Public presentations will be made as part of “Math Day” on a Saturday late in the semester (date has not been determined yet). More on this later, including suggestions on topics and due-dates.

**Grades** Grades will be based on the following breakdown: Quizzes — 65%; Project — 5%; Reading Questions — 5%; Final — 25%. Homework, attendance and improvement will be considered for borderline grades. Scores will be posted on the Internet at <http://buzzard.ups.edu/courses.html>. A reminder about withdrawals — a Withdrawal Passing grade (W) can only be given during the third or fourth weeks of the semester, after that time (barring unusual circumstances), the appropriate grade is a Withdrawal Failing (WF), *even if your work has been of passing quality*. See the attached schedule for the last day to drop with an automatic ‘W’ and please read *Academic Handbook* at <http://www.ups.edu/x4727.xml#withdrawal> about these often misunderstood grades.

**Attendance** Daily attendance is required and expected, and is a pretty good idea.

**Purpose** At this point in your college career, you should be well on your way to being an independent scholar, who appreciates the beauty of mathematics and understands the effort needed to master new and difficult ideas. Consistent with that, I will be giving you a fair degree of freedom to learn this material in a manner that suits you.

Read the book before the lectures, work the exercises diligently, tidy up your class notes each evening, and ask questions. Arriving late to class, or having conversations with others during class, not only disrupts your peers, but tells me you are not serious about your education. I will not routinely check attendance, but our class is small enough that I will notice when you are not here, and again this will be another way that you signal me about your commitment to the endeavor.

Many consider Galois Theory (the final branch of Abstract Algebra that we will concentrate on this semester) one of the most remarkable achievements in mathematics. The investment of your time and energy applied to studying the preparatory material will be amply repaid by a full understanding of the concluding material.

## Homework Exercises (Gallian)

Chap	Page	Computational	Theoretical
12	234	2, 12, 20, 40, 45	18, 22, 27, 29, 43, 48
13	246	6, 11, 19 (see 16), 20 (see 13), 35, 60	14 (see 13), 24, 41, 46, 54, 55 (see 23)
14	260	5, 6ab, 22, 27, 29, 30, 34, 35, 42 (see 40), 45	10, 32, 39, 53
15	277	5, 6, 12, 15, 20, 21, 38	29, 30, 37, 40, 44, 54, 56
16	290	12, 13, 18, 22, 23	4, 8, 9, 21, 24, 30, 31, 40
17	307	8, 10, 11, 14, 21, 23	12, 19, 25, 30, 33
18	325	13, 14, 17, 19, 21	8, 10, 12, 27, 31, 32, 35
19	339	5, 6, 13, 15, 22	2, 8, 11, 19, 24, 27, 29, 30, 31
20	357	1–5, 7, 8, 9, 13, 25, 26	21
21	369	8, 12, 14, 16, 24, 26	2, 4, 7, 9, 11, 18, 23
22	381	1, 6, 11, 20, 21, 26	5, 10, 18, 25
23	389	3, 4, 5, 7	8, 9, 14
32	560	2, 10, 11, 12, 18	7, 8, 23, 25

## Homework Exercises (Rotman)

Chap	Problems
12	1, 5, 7, 8
13	10, 11, 13, 16
14	31, 33, 37
15	27, 29
16	40, 45
17	53, 58, 64, 65
18	
19	68, 69, 71
20	
21	
22	
23	Appendix C
32	

# Tentative Daily Schedule

Monday	Tuesday	Wednesday	Friday
Jan 16 MLK Day	Jan 17 Syllabus Chapter 12	Jan 18 Chapter 12 RQ Due	Jan 20 Chapter 12
Jan 23 Chapter 13 RQ Due	Jan 24 Problem Session	Jan 25 Chapter 13	Jan 27 Chapter 13
Jan 30 Problem Session	Jan 31 Quiz: 12 & 13	Feb 1 Chapter 14 RQ Due	Feb 3 Chapter 14
Feb 6 Chapter 15 RQ Due	Feb 7 Problem Session	Feb 8 Chapter 15	Feb 10 Chapter 15
Feb 13 Problem Session Last day to drop	Feb 14 Quiz: 14 & 15	Feb 15 Chapter 16 RQ Due	Feb 17 Chapter 16
Feb 21 Chapter 17 RQ Due	Feb 22 Problem Session	Feb 23 Chapter 17	Feb 25 Chapter 17
Feb 27 Problem Session	Feb 28 Quiz: 16 & 17	Mar 1 Chapter 18 RQ Due	Mar 3 Chapter 18
Mar 6 Chapter 19 RQ Due	Mar 7 Problem Session	Mar 9 Chapter 19	Mar 10 Chapter 19

Mid-Term

Monday	Tuesday	Wednesday	Friday
Mar 20 Problem Session	Mar 21 Quiz: 18 & 19	Mar 22 Chapter 20 RQ Due	Mar 24 Chapter 20
Mar 27 Chapter 21 RQ Due	Mar 28 Problem Session	Mar 29 Chapter 21	Mar 31 Chapter 21
Apr 3 Problem Session	Apr 4 Quiz: 20 & 21	Apr 5 Chapter 22 RQ Due	Apr 7 Chapter 22
Apr 10 Chapter 23 RQ Due	Apr 11 Problem Session	Apr 12 Chapter 23	Apr 14 Chapter 23
Apr 17 Problem Session	Apr 18 Quiz: 22 & 23	Apr 19 Chapter 32 RQ Due	Apr 21 Chapter 32
Apr 24 Chapter 32	Apr 25 Problem Session	Apr 26 Chapter 32	Apr 28 Chapter 32
May 1 Problem Session	May 2 Quiz: 32	May 2 Housekeeping	

Final Examination  
8:00 AM, Wednesday, May 10