Gannon University
Math 309-01, Fall 2009
Abstract Algebra 1
TTh 9:30am – 10:50am
Beyer 313

Instructor:	Dr. Geoffrey D. Dietz
Department:	Mathematics
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Office:	Zurn 408
Office Phone:	871-7595
Office Hours:	MWF 9am–11am or by appointment
Text:	**A First Course in Abstract Algebra, 7th Edition.** Fraleigh, 2003.
Web Site:	http://www.gannon.edu/faculty_staff/faculty/dietz005/teaching/F09-309.html

1. **Credits and Prerequisites.** Math 309 is worth 3 credits. The prerequisites are Math 222: Discrete Math 1 and Math 243: Calculus 4.

2. **Course Content.** Fundamentals of groups, rings, and homomorphisms.
   We will cover Chapters 1–5 and 9 in the text listed above. You are expected to read the assigned sections before every class and be prepared to answer questions. Not everything in the text will be restated in class. It is your responsibility to read and comprehend material in the assigned sections.

3. **Course Objectives.**
   - Restate major results in modern algebra using correct definitions, hypotheses, and conclusions.
   - Compose correct and logically valid proofs of algebraic theorems.
   - Define an equivalence relation and explain its connection to partitions.
   - Perform computations using the concept of congruence modulo n.
   - Know the definitions of and give examples of groups and subgroups, including cyclic, permutation, and symmetry groups.
   - Explain and apply Cayleys Theorem.
   - Explain and apply Lagrange's Theorem.
   - Know the definition of a group homomorphism and the connection to quotient groups through the Fundamental Homomorphism Theorem.
   - Know the definitions and give examples of rings, fields, integral domains, and ideals.

4. **Evaluation.** Homework assignments will be collected regularly. Additional practice problems will also be assigned but not collected. Student presentations of theorems, proofs, and examples from the text will be given in class. Regular participation in presentations is expected. Two exams will be held during regular class time during the semester, and the dates may be subject to change. Each of these exams will consist of an in-class (just the facts!) portion and a take-home (prove it!) portion. A cumulative final exam will also be given.

5. **Grading.** Final grades will be based on

   A: 90–100 B+: 85–89 B: 80–84 C+: 75–79 C: 70–74 D: 60–69 F: 0–59.

   The ranges may be widened at my discretion. The grades are weighted as follows:

Exam 1 (Tues. 10/13):	20%
Exam 2 (Tues. 11/24):	20%
Final Exam (Thurs. 12/17 8:30am–10:30am):	25%
Homework:	20%
Presentations:	15%

6. **Attendance.** Attending every class is necessary to maximize your success in this course, especially since many classes will be devoted to student presentations. Regular attendance of scheduled office hours is also recommended if you have additional questions or concerns about any aspect of the course. You are responsible for obtaining any information missed due to absence.

7. **Excused Absences.** An excused absence from an exam will only be given when the absence is truly unavoidable and beyond your control. If you have advanced warning of a situation that will cause you to miss an exam, you must arrange to take a make-up exam before your absence. An exam missed due to illness must be made up the following day unless excused by a doctor.

8. **Academic Integrity.** Students are assumed to be familiar with the Academic Integrity Policy found in the current edition of the student handbook. Cheating or dishonesty may result in a failing course grade or even expulsion from the University.

9. **Student Disabilities.** Gannon University is committed to providing reasonable accommodation for all students with disabilities. Students with disabilities who require accommodations in this course are requested to speak with me as early in the semester as possible. You must also be registered with The Program for Students with Learning Disabilities prior to receiving accommodations in this course.

10. **Homework Guidelines.**
    - Graded homework in this course must consist of complete, neatly written solutions to the assigned problems. As this course is proof-based, the quality of your arguments and writing are extremely important.
    - Assignments are due at the beginning of class.
    - Print your name and "Math 309" at the top of the first page.
    - Staple all pages of your homework before submission.
    - Label each problem by section and number. The problems should be written out in the proper order when submitted.
    - Start each problem with a *brief* summary.
    - Discussing the solutions to problems with others is permitted and encouraged. You must, however, turn in your own copy of the homework with your own written solutions. Word-for-word copies constitute academic misconduct.
    - Include the names of anyone (other students, tutors, faculty, etc.) who helped you out on each problem.
    - Incorrect or (somewhat) incomplete work may be resubmitted before the next exam for full credit. Only problems with a significant amount of work toward a solution may be submitted for regrading.
    - Failure to follow these guidelines may result in the loss of points on assignments.

11. **Presentation Guidelines.**
    - Time in class every week will be devoted to student presentations. The purpose of a class presentation is not to prove to the instructor that the student has done the problem but is to make the ideas of the proof or example clear to the other students.
    - A presentation should be written out on paper beforehand so that it flows smoothly in class. Extra explanation in the process of writing is important while writing in silence is not a good idea.
    - Aim for about 5 minutes per presentation. Quality and not quantity is always better for a solution.
    - Other students in the class are encouraged to ask questions at any time.
    - The evaluation of a presentation will be based on both content and quality with expectations starting low and rising as the semester progresses. It is in your best interests to regularly present problems and not delay until the end of term.
    - Each student will be expected to make 5 (or more) presentations during the semester. Aim to have 2 or 3 presented before Fall break.

Math 309-01 Tentative Schedule for Fall 2009

Date	Day	Sect.	Practice	Presentation	HW	Due
8/27	Th	0	1–11, 23, 24, 29–35	25, 28, 36(a,b,c)	12, 29, 34	
9/1	T	I.2	1–11, 17–22, 24, 29–34	6, 10, 23, 37	4, 8, 26, 36	#1
9/3	Th	I.3	3–15, 20	25, 26, 27, 29, 30, 31	2, 4, 8, 28, 32	9/15
9/8	T	I.4	1–5, 11–17, 23, 25	19, 20[use $\mathbb{Z}_4$ in (b)],	4, 8, 18, 31, 35	
9/10	Th			28, 34, 36, 41		
9/15	T	I.5	1, 4–7, 10–12, 21, 23, 27, 28, 33, 39, 42	8, 9, 40, 45, 49, 51, 52	2, 3, 20, 36, 41	#2 9/29
9/17	Th	I.6	1–11, 17, 23, 27, 32, 33	22, 28, 45	2, 10, 18, 44, 49	
9/22	T					
9/24	Th	II.8	1–9, 17, 35	20, 36, 46	2, 6, 16, 18, 40	
9/29	T	II.9	1–13, 23	24, 31, 32	2, 6, 8, 12	#3
10/1	Th	II.10	1–5, 13, 15, 19–24, 27	28–33, 35, 38, 39	4, 16, 34, 40, 41*	10/13
10/6	T	II.11	1–11, 14, 15–25, 29, 32, 33, 36	27, 28, 46, 50, 51	2, 6, 20, 24, 47, 49	
10/8	Th	Review				
10/13	T	**Exam #1**				
10/15	Th	**Fall Break**				
10/20	T	III.13	1–29, 32, 33–39, 49	26, 44, 46, 47, 50	2, 18, 20, 38, 45	
10/22	Th	III.14	1–15, 23, 24, 40	25, 31–33, 39	6, 8, 12, 14, 30	#4
10/27	T	III.15	1–11, 19, 28	35, 36, 39*, 40, 41	4, 10, 16, 34	11/3
10/29	Th	IV.18	1–11, 15–23, 27, 31, 33, 36, 43	37, 39, 41, 48, 50, 52	6, 12, 20, 22, 38	
11/3	T					
11/5	Th	IV.**22**	1–9, 13, 15, 20, 21, 23†	24†, 25†, 27, 30(b), 31	4, 6, 10, 14, 22	#5
			†: complete after IV.19			11/19
11/10	T	**Advising Day**				
11/12	Th	IV.**23**	1–21, 25–29, 35	26, 31, 36, 37	4, 8, 12, 16, 20	
11/17	T	IV.**19**	5–13, 17, 20	18, 25, 26, 28, 30	10, 12, 23, 29	
11/19	Th	IV.**21**	1, 4, 10, 15, 17	6, 9, 12	7, 8, 11, 14	
11/24	T	**Exam #2**				#6
11/26	Th	**Thanksgiving**				12/8
12/1	T	IV.**20**	1–17, 23, 29	6, 8, (27, 28)	2, 10, 14, 24, **IV.22:** 16	
12/3	Th	V.26	1, 3, 9–15, 18	2, 16, 21, 22, (34, 36)	4, 8, 17, 26, 30	
12/8	T	IX.45	1–9, 21, 23, 27	28, 30	10, 25, 26	#7
12/10	Th	IX.46	1–9, 13		2, 8, 12	12/17
12/17	Th	**Final Exam**, 8:30am – 10:30am				