

# Math 8221: Abstract Algebra II — Spring 2025 (Section 002, CRN 20974)

11:00am–12:15pm, Tuesdays and Thursdays, 325 Classroom South (CS)

**Instructor:** Yongwei Yao

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**Lecture:** 11:00am–12:15pm, Tuesdays and Thursdays, 325 Classroom South (CS).

**Office Hours:** 12:45–2:15pm, Tuesdays and Thursdays, online via Webex (URL posted on iCollege).

**Textbook:** *Basic Abstract Algebra* (2nd edition) by P. B. Bhattacharya, S. K. Jain and S. R. Nagpaul, Cambridge University Press, ISBN 0-521-46629-6. The lectures will be based on this textbook, covering materials in Chapters 8, 14, 19, 20, 21, 22.

Alternative textbook: *Abstract Algebra* (3rd edition) by David S. Dummit and Richard M. Foote, John Wiley & Sons Inc., ISBN 0-471-43334-9.

**Course content/outcome:** The course offers a solid introduction to module theory, covering its basic concepts and fundamental theorems. This will be applied to the theory of abelian groups. The course will cover modules, submodules and quotient modules, direct sums, homomorphisms, free modules, Noetherian and Artinian modules, Smith normal form, structure of finitely generated modules over a PID, Rational canonical forms, Jordan normal forms, finitely generated abelian groups, tensor products, etcetera. Students passing the course should be able to present proofs, understand the majors results as well as apply them in solving routine exercises.

**Prerequisites:** Math 8220 with a grade of C or higher. During the first two weeks of the semester the Department of Mathematics and Statistics checks the computer records to determine whether or not each student has met the prerequisites for this course. If you do not have the prerequisites please inform your instructor and change to another course. In case the system finds that you don't have the prerequisites, you need to drop this course. If you miss all the classes during the first two weeks, you will be administratively withdrawn.

**Homework:** There will be weekly homework assignments that will be graded. You can discuss the problems with your classmates, but the write-up of the solutions has to be done individually according to your own understanding. Identical solutions will not be graded. **Show your work/steps. No late homework is accepted.** Homework weighs 25% of overall performance.

**Exams:** There will be two midterm exams and a final exam, all online and independent work.

Exam	Date	Time	Location	Weight
First Exam	Feb. 20 (Thursday), 2025	11:00am–12:15pm	325 CS	25%
Second Exam	April 03 (Thursday), 2025	11:00am–12:15pm	325 CS	25%
Final Exam	May 01 (Thursday), 2025	10:45am–1:15pm	325 CS	25%

All three exams are required and the final exam is cumulative. Make-up exams will only be allowed in case of extreme emergencies that must be documented, such as medical emergencies. It is the instructor's role to determine if a specific emergency is a valid one.

(more on the next page)

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**Grading Scheme:** Total scores are computed by using the weights as follows:

Component	Homework	Midterm Exam I	Midterm Exam II	Final Exam
Weight	25%	25%	25%	25%

Then the letter grades will be assigned as follows:

Score (%)	97–	93–96	90–92	87–89	83–86	80–82	77–79	70–76	60–69	0–59
Grade	A+	A	A–	B+	B	B–	C+	C	D	F

**Attendance:** You are expected to attend regularly for the entire period of the class. That is, you are expected to arrive on time and stay for the duration of the class. Attendance will be taken periodically. If you miss all the classes during the first two weeks, you could get withdrawn administratively. After five or more absences a student could get withdrawn from this class. In case of an absence, the student is responsible for knowing/studying all the materials covered. For university policies, see <http://codeofconduct.gsu.edu/>

**Important withdrawal dates:** Remember that a student who misses all the lectures during the first two weeks can be withdrawn by the instructor.

Last day to add/drop classes: Friday, Jan. 17, 2025, 5:00pm. See PAWS or GoSolar.

Last day to withdraw and possibly receive a **W** (semester midpoint): Tuesday, Mar. 04, 2025

For details, see <http://advisement.gsu.edu/self-service/policies/withdrawal-policy/>

**Academic (dis)honesty:** Academic honesty is expected. Cheating will not be tolerated and will be handled according to the University’s policy on academic honesty found at <http://codeofconduct.gsu.edu/>, which includes academic as well as disciplinary consequences.

**Teaching evaluations:** Your constructive assessment of this course plays an indispensable role in shaping education at Georgia State. Upon completing the course, you are welcome to fill out the online course evaluation.

**Disability:** Students who wish to request accommodation for a disability may do so by registering with the Office of Disability Services. Students may only be accommodated upon issuance by the Office of Disability Services of a signed Accommodation Plan and are responsible for providing a copy of that plan to instructors of all classes in which accommodations are sought.

**Other Important dates:**

Martin Luther King Holiday (no classes)	Jan. 20 (Monday), 2025
Spring Break (no classes)	March 17–23, 2025
Last Day of Classes	April 28 (Monday), 2025

**Changes:** This course syllabus provides a general plan for the course; deviations may be necessary.

**Course URL:** <https://math.gsu.edu/yyao/2025Sp/math8221.html>

Relevant information (homework assignments, etc.) will be posted there as the course progresses.

Welcome aboard!