Syllabus for MATH 374 Intro to Representation Theory, Fall 2025

Instructor: Dr. Chelsea Walton

Email: notlaw@rice.edu.

Course website: https://math.rice.edu/~notlaw/teaching.html#current

Format: In-person lectures & online lectures - see the Teaching Schedule. The assessment towards your final grade will consist of weekly homework sets, 3-4 twenty minute lectures, and providing helpful feedback on lectures.

Lecture Days, Times, and Location: MWF 10:00AM - 10:50AM in 453 HBH.

Office Hours: The instructor is available by appointment at MW 11:00am–11:50am at 328 HBH (in-person appointments can be made in class on the same day) or by Zoom appointment.

Prerequisite courses: Linear Algebra (MATH 221, MATH 354, or MATH 355) and MATH 356

Textbooks: Representations and Characters of Groups, 2nd ed, by G. James and M. Liebeck. See 'Welcome Email' for course material.

> Note: The notation of reading the composition of maps from left-to-right in James and Liebeck's textbook is not standard. We will opt for the traditional approach of reading the composition of maps from right-to-left in the lectures and in the HW.

Course Objectives: Successful students will gain experience with concepts and methods of representation theory at an introductory level, focusing on the representation theory of groups. Students will develop their skills in the written and oral communication of mathematical ideas by completing the homework sets and by presenting several short lectures on the course material. See the Teaching Schedule on the course website for more details on the topics covered in the course.

Lecture Notes: Some lecture notes will be provided via Dropbox. See 'Welcome Email'.

Assessment, % of Course Grade: Homework 50%, Lectures 45%, Feedback 5%.

See the Teaching Schedule on the course website for assignments and due dates. Students will be responsible for keeping track of their own grades. Attendance will be taken occasionally. Along with graded assignments, the instructor will take into consideration attendance, participation in class, and growth throughout the semester for assessment needed after the end of the course (e.g., for letters of recommendation).

Homework: There will be 6 homework sets, due **by 9:30am *sharp*** on the due date. Homework solutions should be submitted through Gradescope; you will receive instructions in the Welcome Email. The lowest homework score will be dropped, so that each homework set is worth 10% of the course grade.

No late homework submissions are allowed.

Each homework score will be out of 10 points, including credit for composition. The use of full sentences, proper grammar, and overall neatness counts towards 'good composition'. See `https://math.rice.edu/~notlaw/teaching.html` for proof writing tips if needed.

Handwritten, tablet, and LaTex solution sets are all acceptable. Students are expected to write up their own solutions, and to acknowledge any references (to theorems, exercises, etc.) and collaborations with peers when pertinent. Solutions hints are provided in the back of the book and students are expected to provide thorough solutions, beyond the hints, for full credit.

Lectures: The lectures by students will be twenty minutes in length, with two lectures per class period. The first lecture will begin at 10:00am sharp, with 5 minutes after for feedback. Then, the second lecture will begin at 10:25am sharp, with 5 minutes after for feedback. It is especially important that you come to class on time.

The first lecture will be a chalk talk; the second will be a slide talk (either online or in-person); the third lecture will be another chalk talk; and the mode of the fourth lecture (if there is a fourth round) will be the speaker's choice.

The first lecture will be worth 3% of the course grade, purely as extra credit. So, no pressure for the first lecture. Try the best that you can for practice.

The number of remaining lectures depends on the course enrollment. Currently, there will be three additional lectures worth 15% each. If additional students join the course, then the number of lecture rounds may decrease and the weight of each lecture (after the second lecture) will increase.

Speaker slots will be randomly assigned at least one week before each round.

Feedback for Lectures: Learning how to provide and receive constructive feedback and encouraging compliments is part of the course. Feedback will be submitted by students after each twenty minute lecture via a Google form that the instructor will provide. Each section of the short form must be complete for full submission credit.

Each submission of feedback is worth 0.15% of your course grade. Anything over 5% total counts as extra credit. For instance, if you provide feedback for 50 student lectures, then you will be awarded 2.5% extra credit.

To ensure that the feedback remains polite and professional, the instructor reserves the right to dock points if feedback is demeaning to the speaker. Such feedback will be removed before passing it along to the speaker. We're here to help each other, so let's stay positive.

The instructor will also provide feedback after each lecture, including a lecture score. This assessment will be independent of the feedback from peers.

Approximate Assignment of Grades:

- 88% - 100% : grade in the A range
- 75% - 87% : grade in the B range
- 74% and below : grade in the C range or below

Academic calendar: See: `https://registrar.rice.edu/calendars/fall-semester-2025`.

Covid-19/ Illness policy: Please keep your classmates healthy by not attending class ill (with a cold, Covid-19, or otherwise). Wearing masks in class is not required. Assignment and assessment arrangements for long-term, symptomatic illness will be accommodated.

Disability Accommodation: Any student who has a need for accommodation based on the impact of a disability should contact me privately to discuss the specific situation as soon as possible. Students should also contact Disability Resource Center (DRC) at `adarice@rice.edu` or 713-348-5841 to obtain a Letter of Accommodation to present to me and to learn about further resources: `https://drc.rice.edu/`.

Statement on Collegiality, Respect, and Sensitivity: The Department of Mathematics supports an inclusive learning environment where diversity and individual differences are understood, respected, and recognized as a source of strength. Racism, discrimination, harassment, and bullying will not be tolerated. We expect all participants in mathematics courses (students and faculty alike) to treat each other with courtesy and respect, and to adhere to the mathematics department standards of collegiality, respect, and sensitivity (`https://mathweb.rice.edu/department-statement-collegiality-respect-and-sensitivity`) as well as the Rice Student Code of Conduct. If you think you have experienced or witnessed unprofessional or antagonistic behavior, then the matter should be brought to the attention of the instructor and/or department chair. The Ombudsperson is also available as an intermediate, informal option, and contacting them will not necessarily trigger a formal inquiry.

Title IX Responsible Employee Notification Rice University cares about your wellbeing and safety. Rice encourages any student who has experienced an incident of harassment, pregnancy discrimination or gender discrimination or relationship, sexual, or other forms interpersonal violence to seek support through The SAFE Office. Students should be aware when seeking support on campus that most employees, including myself, as the instructor/TA, are required by Title IX to disclose all incidents of non-consensual interpersonal behaviors to Title IX professionals on campus who can act to support that student and meet their needs. For more information, please visit safe.rice.edu or email titleixsupport@rice.edu.