Abbreviated Course Syllabus: Intro to Modern Algebra (Math 3096)

How this course will be taught: In person.
Time: Recitation: W 8:00-8:50am. Lecture: TR 2:00--3:20pm.
Place: Recitation: Wachman 009. Lecture: Wachman 016.

Instructor: Martin Lorenz.
Instructor Office: Wachman 528.
Instructor Email: lorenz@temple.edu
Instructor Phone: Use email.
Office Hours: TR 3:30--5:00pm and by appointment.

Prerequisites: Math 2111 (Basic Concepts of Mathematics).

Textbook: Abstract Algebra: An Introduction, by Thomas Hungerford. 3rd ed.

Course Goals: This course will primarily deal with the theory of rings. A particular emphasis will be on writing mathematical proofs in the context of modern algebra. Written proofs must offer the reader a logical and well-organized narrative explanation of an approach to a solution of a problem; they should be written in carefully edited prose involving complete sentences. Students will also be expected to research a topic relevant to the course, write a paper on the topic, and report on the topic to the class.

Topics Covered: Integers, modular arithmetic, rings, polynomial rings, ideals and quotient rings. This material will largely be based on Chapters 1-6 of the textbook. However, since some of Hungerford's choices are unusual, *I will occasionally adopt different conventions*. This will be explicitly pointed out in class whenever it occurs. If time permits, then I may also cover a selection of topics from Chapters 7 & 8 (Group Theory).

Canvas: This course will use Canvas. After each class, I will post my lecture notes on Canvas along with other important announcements.

Course Grading: There will be *two midterm exams*, each of which will count for 13% of your grade; a comprehensive *final exam* counting for 20%; and a *presentation* counting for 10%. In addition, there will be regular *quizzes* counting 14% total and *written homework* counting 30% total.

Exams: The two midterms are tentatively scheduled for **February 22** and **April 11**; both will be given during the regular class period. The final exam will be on **May 2, 1:00am-3:00pm**. All exams occur on a Thursday and will be given in our regular classroom; they will be *open-book and open-notes tests*. Materials on the Canvas page of this course can be accessed, but no other external resources are permitted.

Attendance Policy: Attendance will be recorded for both lectures and recitations; it will be considered in midterm ratings and in borderline grade cases at the end of the semester. Office hours may not be used to cover material missed due to unjustified absences.

Teaching Assistant: The TA for this course is **Aniruddha Sudarshan**. He will hold the recitations and grade all quizzes. Aniruddha's office hours are on T 2-3pm and W 9-10am in Wachman 521. You can also find Aniruddha at the Math Consulting Center (MCC) in Wachman 1036 on T 3-5pm and W 10-12am.

Recitations & Quizzes: Our weekly recitations will serve to (1) practice material covered in class, (2) answer any questions that you might have, and (3) give regular short quizzes, starting with Recitation #2 (on Sept 11). Each quiz will have a maximum score of 10. There will be no make-up quizzes, but your lowest two quiz scores will be dropped from the calculation of your course grade. Solutions to all quizzes will be posted on Canvas.

Homework: Written homework will be assigned approximately every other week; it will be posted and collected through Canvas. Each assignment will consist of four problems and will go through two rounds of grading, with one revision. Three of the assigned problems will only be checked for completeness, with possible scores being 0, 1 or 2. The fourth problem, chosen after the deadline, will be graded and annotated with detailed rewriting instructions (if needed). In the first round, I will assign a preliminary score to this problem. You will have the opportunity to resubmit a revised solution to improve your preliminary score up to the maximum of 6. Thus, the maximum score for each HW will be 12. Your lowest HW score will be dropped from the calculation of your course grade. Complete solutions of all homework problems will be posted on Canvas.

Presentations: Each student is expected to give a presentation to the class on a topic of their choice, which must be related to the material covered in this course. A list of possible topics will be discussed in class and posted on Canvas toward the end of the semester. Students are expected to work on their chosen topic in groups of two or three, with each member of the group being responsible for a particular aspect (background, theory, applications, etc). Further details will be communicated in due course.

A.I.: The use of generative AI tools (such as ChatGPT, DALL-E, etc.) for written assignments is not permitted in this class, since the work is not your own. Therefore, any use of AI tools for written work in this class may be considered a violation of Temple University's Academic Honesty policy and Student Conduct Code. The unauthorized use of AI tools will result in a grade of zero for the assignment.