

College of Arts and Sciences

Mathematics

MATH 415 Syllabus

Section 200 (12002)
MODERN ALGEBRA I
Fall 2026 - College Station



Course Information

Meeting Times: Meeting Type: LEC

Meeting Days: TR

Start Time: 09:35AM

End Time: 10:50AM

Start Date: 08/24/2026

End Date: 12/10/2026

Meeting Location: BLOC 121

Credit Hours: 3

Instructor Details

Frank Sottile

Email: sottile@tamu.edu

Office Location: Blocker 601L

Phone: 979-845-7554

Office Hours

Tu-Th 11-12 in Blocker 601L, or by appointment

Preferred Contact Method

sottile@tamu.edu

Webpage: <https://franksottile.github.io/>

Biography

<https://franksottile.github.io/biography.html>

Catalog Description

Modern Algebra I. (3-0). Credit 3. A study of groups, rings, fields with emphasis on the theoretical aspects and proofs. Prerequisite: MATH 300; MATH 304, MATH 309, MATH 311, or MATH 323.

Additional Course Details

This course is an Honors version of Modern Algebra I.

Course Prerequisites

Prerequisite/Corequisite(s): MATH 300; MATH 304, MATH 309, MATH 311, or MATH 323.

Course Learning Outcomes

Upon completion of this course, the learner will be able to:

- Explain the theory of groups, rings, and fields, including subgroups, subrings, homomorphisms, and quotient constructions.
- Describe many examples of groups, rings, and fields and their properties.
- write rigorous proofs of statements about groups, rings, and fields.

This course will meet the enhanced learning objectives of an honors course by the use of richer homework assignments and higher-level lectures.

Special Course Designation

None

Textbook and/or Resource Materials

This material is: Recommended

A First Course in Abstract Algebra

ISBN: 9780136731627

Authors: John B. Fraleigh and Neal E. Brand

Publisher: Pearson

Publication Date: 2021

Edition: 8

Notes:

Any version of this book will suffice, as well as other sources. The course material will be what is presented in lectures.

Grading Policy

Homework is worth 1/5 of your grade. Two in-class exams are worth 1/5 of your grade each. The final exam is worth 2/5 of your grade. Grades are assigned as follows based on your average: A (85-100%), B (75-84%), C (65-74%), D (55-64%), F (0-54%).

Late Work Policy

Work submitted by a student as makeup work for an excused absence is not considered late work and is exempt from the late work policy ([Student Rule 7](#)).

Course Specific Late Work Policy

Late work will generally not be accepted.

Course Schedule

I hope to cover the following material in the indicated weeks.

- Week 1 (8/24 & 8/27): Sections 1, 2 (binary operations, groups)
- Week 2 (9/1 & 9/3): Sections 3, 4 (abelian and nonabelian groups)
- Week 3 (9/8 & 9/10): Sections 5, 6 (subgroups, cyclic groups)
- Week 4 (9/15 & 9/17): Sections 7, 8 (generating sets, Cayley digraphs, permutations)
- Week 5 (9/22 & 9/24): Sections 9, 10 (finitely generated abelian groups, cosets, Lagrange's Theorem)
- Week 6 (9/28 & 10/1): Section 11 (plane isometries), EXAM 1 Thursday 10/1
- Week 7 (10/6 & 10/8): Sections 12, 13 (factor groups, computations, simple groups)
- Week 8 (10/13 & 10/15): Sections 14, 15 (group actions on sets, applications of G-sets to counting)

- Week 9 (10/20 & 10/22): Sections 16, 17 (isomorphism theorems, Sylow Theorems)
- Week 10 (10/27 & 10/29): Sections 18, 19 (series of groups, free abelian groups)
- Week 11 (11/3 & 11/5): Sections 20, 21 (free groups, group presentations),
- Week 12 (11/10 & 11/12): EXAM 2 Tuesday 11/10, Section 22 (rings and fields)
- Week 13 (11/17 & 11/19): Section 23 (integral domains)
- Week 14 (11/24): Section 24 (Fermat's and Euler's Theorems)
- Week 15 (12/3): Section 26 (field of quotients of an integral domain)
- FINAL EXAM: Monday December 7 at 12:30 PM

Additional Course Information

This will be a serious, high-level course. You are encouraged to read course material before it is discussed in class, and then revise/rework your notes before the next class. To help you gain mastery, homework will be assigned and collected weekly.

AI Statement

Writing and critical thinking skills are among the learning outcomes of this course. All writing assignments should be prepared by the students themselves. Working in groups on homework is fine and encouraged, but each student should write up their own solutions in their own words. AI-generated submissions are not permitted.

Technology Support

Technology Services (IT) - Main Campus

Hours: 24/7

Phone: (979) 845-8300

Email: helpdesk@tamu.edu

Call/Chat/Email/visit: <https://it.tamu.edu/help>

Canvas LMS Technical Support

Hours: 24/7/365

Phone: (877) 354-4821

Email: support@instructure.com

Support is available by clicking the Help button at the far left in the Canvas global navigation menu.

Canvas Resources are also linked on the home page of every Canvas course.

University Policies

This section outlines the university-level policies that must be included in each course syllabus. The TAMU Faculty Advisory Council established the wording of these policies.

Academic Integrity Statement and Policy

"An Aggie does not lie, cheat or steal, or tolerate those who do."

"Texas A&M University students are responsible for authenticating all work submitted to an instructor. If asked, students must be able to produce proof that the item submitted is indeed the work of that student. Students must keep appropriate records at all times. The inability to authenticate one's work, should the instructor request it, may be sufficient grounds to initiate an academic misconduct case" (Section 20.1.2.3, [Student Rule 20](#)).

You can learn more about the Aggie Honor System Office Rules and Procedures, academic integrity, and your rights and responsibilities at aggiehonor.tamu.edu.

University Attendance Policy

The university views class attendance and participation as an individual student responsibility. Students are expected to attend class and to complete all assignments.

Please refer to [Student Rule 7](#) in its entirety for information about excused absences, including definitions, and related documentation and timelines.

Makeup Work Policy

Students will be excused from attending class on the day of a graded activity or when attendance contributes to a student's grade, for the reasons stated in Student Rule 7, or other reason deemed appropriate by the instructor.

Please refer to [Student Rule 7](#) in its entirety for information about makeup work, including definitions, and related documentation and timelines.

Absences related to Title IX of the Education Amendments of 1972 may necessitate a period of more than 30 days for make-up work, and the timeframe for make-up work should be agreed upon by the student and instructor" ([Student Rule 7, Section 7.4.1](#)).

"The instructor is under no obligation to provide an opportunity for the student to make up work missed because of an unexcused absence" ([Student Rule 7, Section 7.4.2](#)).

Students who request an excused absence are expected to uphold the Aggie Honor Code and Student Conduct Code. ([See Student Rule 24](#).)

Notice of Nondiscrimination

Texas A&M University is committed to providing safe and non-discriminatory learning, living, and work environments for all members of the University community. The University provides equal opportunity to all employees, students, applicants for employment or admission, and the public, regardless of race, color, sex (including pregnancy and related conditions), religion, national origin, age, disability, genetic information, or veteran status.

Texas A&M University will promptly, thoroughly, and fairly investigate and resolve all complaints of discrimination, harassment (including sexual harassment), complicity, and related retaliation based on a protected class in accordance with [System Regulation 08.01.01](#), [University Rule 08.01.01.M1](#), [Standard Administrative Procedure \(SAP\) 08.01.01.M1.01](#), and applicable federal and state laws. In accordance with Title IX and its implementing regulations, Texas A&M does not discriminate on the basis of sex in any educational program or activity, including admissions and employment.

The following person has been designated to handle inquiries and complaints regarding the non-discrimination policies: Jennifer M. Smith, TAMU Associate VP & Title IX Coordinator at YMCA Ste 108, College Station, TX 77843, 979-458-8407, or email civilrights@tamu.edu. For other reporting options, visit the [U.S. Department of Education Office for Civil Rights Complaint Assessment System](#) to locate the address and phone number of the office that serves your area, or call 1-800-421-3481.

Civil Rights, Free Speech, and Title IX Policies

Texas A&M University is committed to fostering a learning environment that is safe and productive for all. University policies and federal and state laws prohibit discrimination and harassment based on an individual's race, color, sex, (including pregnancy and related conditions), religion, national origin, age, disability, genetic information, veteran status, or any other legally protected characteristic. This includes forms of sex-based violence, such as sexual assault, sexual harassment, sexual exploitation, dating/domestic violence, and stalking.

Students can report discrimination/harassment, access supportive resources, or learn more about their options for resolving complaints on the [University's Civil Rights & Title IX webpage](#).

Students should be aware that all university employees (except medical or mental health providers) are mandatory reporters, which means that if they observe, experience or become aware of an incident that they reasonably believe to be discrimination/harassment alleged to have been committed by or against a person who was a student or employee at the time of the incident, the employee must report the incident to the university.

Americans with Disabilities Act (ADA) Policy

Texas A&M University is committed to providing equitable access to learning opportunities for all students. If you experience barriers to your education due to a disability or think you may have a disability, please contact the Disability Resources office on your campus (resources listed below). Disabilities may include, but are not limited to, attentional, learning, mental health, sensory, physical, or chronic health conditions. All students are encouraged to discuss their disability-related needs with Disability Resources and their instructors as soon as possible.

To request academic accommodations, contact the designated ADA office based on your location:

- Texas A&M University, College of Nursing, College of Dentistry, Irma Lerma Rangel College of Pharmacy College Station, College of Medicine, School of Public Health, Institute of Biosciences and Technology, EnMed Program, Bush School in Washington DC, Mays Business School – CityCentre, TAMU Engineering Academies, Texas A&M University Higher Education Center at McAllen and Texas A&M University at Galveston should contact Disability Resources at (979) 845-1637 or disability@tamu.edu.
- Texas A&M University School of Law should contact the Office of Student Affairs at (817) 212-4111 or law-disability@law.tamu.edu to request accommodations.
- Irma Lerma Rangel College of Pharmacy in Kingsville should contact the Disability Resource Center at Texas A&M University-Kingsville at (361) 593-3024 or drc.center@tamuk.edu to request accommodations.
- Texas A&M University College of Veterinary Medicine & Biomedical Sciences in Canyon should contact the Office of Student Accessibility at West Texas A&M University – Canyon at (806) 651-2335 or osa@wtamu.edu.

If you are experiencing difficulties with your approved accommodations, contact the office responsible for approving your accommodations or the Texas A&M ADA

Coordinator Julie Kuder at ADA.Coordinator@tamu.edu or (979) 458-8407.

Pregnancy Accommodations

Texas A&M provides reasonable accommodations to students due to pregnancy and/or related conditions, such as childbirth, recovery, and lactation. Students should contact the University's [Pregnancy Coordinator](#) as soon as they become aware of the need for accommodation. Depending on the circumstances, accommodations could include extended time to complete assignments or exams, changes in course sequence, or modifications to the physical classroom environment.

Texas A&M will also allow a voluntary leave of absence, ensure the availability of lactation space, and maintain grievance procedures to provide for the prompt and equitable resolution of complaints of sex discrimination. For information regarding pregnancy accommodations, email TIX.Pregnancy@tamu.edu.

Statement on Mental Health and Wellness

Texas A&M University recognizes that mental health and wellness are critical factors influencing a student's academic success and overall wellbeing. Students are encouraged to engage in healthy self-care practices by utilizing the resources and services available through [University Health Services](#). The [TELUS Health Student Support app](#) provides access to professional counseling in multiple languages anytime, anywhere by phone or chat, and the 988 Suicide & Crisis Lifeline offers 24-hour emergency support at 988 or 988lifeline.org.

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Students needing a listening ear can contact University Health Services at 979.458.4584. Call 911 or visit your nearest emergency room if you are currently experiencing a life-threatening situation or if your safety is at risk. 24-hour emergency help is also available through the 988 Suicide & Crisis Lifeline (988) or at 988lifeline.org.

Statement on the Family Educational Rights and Privacy Act (FERPA)

FERPA is a federal law designed to protect the privacy of educational records by limiting access to these records, to establish the right of students to inspect and review their educational records, and to provide guidelines for the correction of inaccurate and misleading data through informal and formal hearings.

Currently enrolled students wishing to withhold any or all directory information items can do so within howdy.tamu.edu using the Directory Information Withholding Form. The complete [FERPA Notice to Students](#) and the student records policy is available on the Office of the Registrar webpage.

Items that can never be identified as public information are a student's social security number, citizenship, gender, grades, GPR, or class schedule. All efforts will be made in this class to protect your privacy and to ensure confidential treatment of information associated with or generated by your participation in the class.

Directory items include name, UIN, local address, permanent address, email address, local telephone number, permanent telephone number, dates of attendance, program of study (college, major, campus), classification, previous institutions attended, degrees, honors and awards received, participation in officially recognized activities and sports, medical residence location, and medical residence specialization.

Free Speech and Civil Discourse

Texas A&M recognizes that the pursuit of truth through open and robust discourse is critical to academic inquiry. However, as a community of scholars, the university has an aspirational expectation that such discourse will be conducted in accordance with Aggie Core Values. In this "marketplace of ideas," we encourage civil dialogue creating an environment that allows individuals to express their ideas and to have their ideas challenged in respectful and responsible ways. Students can learn more about Freedom of Expression and Free Speech on the [University's website](#) about the First Amendment.