



MATH 550.01W, Foundations of Abstract Algebra

COURSE SYLLABUS: FALL 2022

INSTRUCTOR INFORMATION

Instructor:	Padmapani (Pani) Seneviratne
Office Location:	BIN 316
Office Hours:	MW 2:00 – 3:00 pm, TR: 12:30 – 2:00 pm
Office Phone:	903-886-5952
Office Fax:	903-886-5945
University email:	padmapani.seneviratne@tamuc.edu
Preferred Communication:	email
Response time:	within 24 hours during weekdays
Class Location:	D2L
Class Time:	Web based

COURSE INFORMATION

Textbook: Abstract Algebra: Theory and Applications, Tom Judson. Freely available at <http://abstract.ups.edu/>

Software : Sagemath computer algebra system will be used. It is available freely at <http://www.sagemath.org/>

Calculator: optional.

Course Description

This course will cover the fundamental properties of algebraic structures such as properties of the real numbers, mapping, groups, rings, and fields. The emphasis will be on how these concepts can be related to the teaching of high school algebra. Note: This course will be helpful to secondary teachers by giving them a better understanding of

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the terms and ideas used in modern mathematics. This is an elective course, eligible for the non-thesis option only. The maximum credit hours can be earned towards the MS degree in math among [MATH 500](#), 550, 560 is six. Prerequisites: [MATH 332](#) or [MATH 500](#) with a minimum grade of C. Crosslisted with: [MATH 334](#). **Student**

Learning Outcomes Upon completion of the course, students will be able to:

1. Write definitions of important concepts such as binary operations, groups, subgroups, homomorphisms and isomorphisms etc.
2. Demonstrate knowledge and understanding of group theory concepts such as subgroups, cyclic groups, factor groups and normal subgroups.
3. Demonstrate knowledge and understanding of ring theory concepts such as subrings and ideals.
4. Use examples to illustrate concepts such as Lagrange's Theorem and isomorphism theorems.
5. Ability to use a computer algebra system to explore and understand abstract concepts in group and ring theory.
6. Learn applications of abstract algebra.

COURSE REQUIREMENTS

Minimal Technical Skills Needed

Access MyLeo online. Learn and use sagemath computer algebra system.

Instructional Methods

In addition to standard teaching methods, sagemath computer algebra system will be used to illustrate concepts interactively.

Student Responsibilities or Tips for Success in the Course

Attend all classes, Do all Homework and quizzes. Use office hours regularly.

GRADING

Final grades in this course will be based on the following scale:

2 Midterm Exams:	50%
Quizzes/HW/projects:	25%
Final Exam:	25%

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Total: 100%

Extra credit: Extra credit will be given to students who participate in the Mathematics Department activities such as attending the colloquium, participate in the Math Bowl/SCUDEM competitions.

A = 90%-100%

B = 80%-89%

C = 70%-79%

D = 60%-69%

F = 59% or Below

Exams: There will be two midterm exams and a comprehensive final exam for this course.

Exam 1: Thursday, September 29th 2022 (5th week), 5:00 – 6:15 pm

Exam 2: Thursday, November 10th 2022 (11th week), 5:00 – 6:15 pm

Final Exam: Tuesday, December 13th 2022: 5:00 – 7:00 pm

Home work/Quizzes: You are required to submit all homework problems and sagemath projects on the due date.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are technical requirements

LMS Requirements:

<https://community.brightspace.com/s/article/Brightspace-Platform-Requirements>

LMS Browser Support:

https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:

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<https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements>

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu.

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

<https://community.brightspace.com/support/s/contactsupport>

COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

You are expected to attend all classes.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

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University Specific Procedures

Student Conduct

Appropriate classroom behavior is required to attend this class.

All cell phones must be put on silent during class.

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the [Student Guidebook](#).

<http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx>

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:

<https://www.britannica.com/topic/netiquette>

TAMUC Attendance

For more information about the attendance policy please visit the [Attendance](#) webpage and [Procedure 13.99.99.R0.01](#).

<http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx>

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf>

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

[Undergraduate Academic Dishonesty 13.99.99.R0.03](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf>

[Graduate Student Academic Dishonesty 13.99.99.R0.10](#)

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf>

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other

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things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services

Texas A&M University-Commerce

Gee Library- Room 162

Phone (903) 886-5150 or (903) 886-5835

Fax (903) 468-8148

Email: studentdisabilityservices@tamuc.edu

Website: [Office of Student Disability Resources and Services](#)

<http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/>

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the [Carrying Concealed Handguns On Campus](#) document and/or consult your event organizer.

Web url:

<http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf>

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information

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regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

COURSE OUTLINE / CALENDAR
Daily Schedule

COURSE OUTLINE / CALENDAR

Weekly Schedule (Tentative)

Week	Topic(section)
1	Introduction to sagemath and preliminaries, Chapter 1
2	Chapter 2
3	Chapter 3
4	Chapter 3
5	Chapter 4, Exam 1
6	Chapter 4
7	Chapter 5
8	Chapter 5
9	Chapter 6
10	Chapter 6
11	Chapter 7
12	Chapter 9, Exam 2
13	Chapter 10
14	Chapter 11
15	Chapter 12, 13

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