

MATH 4332-110, 10445, Abstract Algebra

Spring 2023

Texas A&M University-Central Texas

COURSE DATES, MODALITY, AND LOCATION

Jan 17 2023 - May 12, 2023

The instructional method is online: “Fully online courses have no on-campus, classroom, or synchronous activity. All course activity is done online. These courses may require virtual proctored exams” The course uses the A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com/>].

Available online resources include:

- the A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com/>].
- pdf text (free) and print textbook (optional): available at <http://abstractalgebra.altervista.org/>
- Youtube video playlist (<https://www.youtube.com/playlist?list=PL2uooHqQ6T7PW5na4EX8rQX2WvBBdM8Qo>)

INSTRUCTOR AND CONTACT INFORMATION

Instructor Jordan Barry

Office: Online (Canvas)

Phone: 512-593-8218

Email: jbarry@tamuct.edu

Office Hours

I will have office hours on Monday and Wednesday 12pm-1pm at my virtual office, linked in Canvas. I will also have many times available outside of this. Please email me to set up a time, and we will find one that works for both of us.

Student-instructor interaction

I typically check my email several times per day; it is the best way to contact me directly. I will also respond to your discussion board posts.

Emergency Warning System for Texas A&M University-Central Texas

SAFEZONE. SafeZone provides a public safety application that gives you the ability to call for help with the push of a button. It also provides Texas A&M University-Central Texas the ability to communicate emergency information quickly via push notifications, email, and text messages. All students automatically receive email and text messages via their myCT accounts.

Downloading SafeZone allows access to push notifications and enables you to connect directly for help through the app.

You can download SafeZone from the app store and use your myCT credentials to log in. If you would like more information, you can visit the [SafeZone](http://www.safezoneapp.com) website [www.safezoneapp.com].

To register SafeZone on your phone, please follow these 3 easy steps:

1. Download the SafeZone App from your phone store using the link below:
 - o [iPhone/iPad](https://apps.apple.com/app/safezone/id533054756): [https://apps.apple.com/app/safezone/id533054756]
 - o [Android Phone / Tablet](https://play.google.com/store/apps/details?id=com.criticalarc.safezoneapp)
[https://play.google.com/store/apps/details?id=com.criticalarc.safezoneapp]
2. Launch the app and enter your myCT email address (e.g. {name}@tamuct.edu)
3. Complete your profile and accept the terms of service

For updates on COVID information, please monitor the University [website](https://www.tamuct.edu/covid19/)
[https://www.tamuct.edu/covid19/]

COURSE INFORMATION

Course Overview and description: Important basic examples and ideas of abstract algebra, including: complex numbers, modular numbers, symmetries; permutations; group axioms and basic properties; equivalence classes; normal subgroups, cosets, and Lagrange's theorem; group actions; and topics in coding theory.

Student Learning Outcomes:

Upon successful completion of MATH 4332, students will be able to:

- a) State and contextualize fundamental mathematical definitions
- b) Recognize and compare properties of mathematical structures
- c) Recognize and interpret hypotheses and conclusions of theorems.
- d) Evaluate the truth of mathematical statements based on definitions and theorems.
- e) Perform standard computations related to the material, and interpret the results of those computations.
- f) Compose and critique mathematical proofs using sound logical argument and appropriate notation.
- g) Demonstrate the use of the theoretical results and computational aspects on required applications; and
- h) Connect the material to concepts in other courses.

Competency Goals Statements (certification or standards):

The student will gain competency in the following Mathematics 7-12 TEKS skills:

1. Competency 001. B. Understands the algebraic structure and properties of the real number system and its subsets (e.g., real numbers as a field, integers as an additive group). (*mastery*)
2. Competency 001.C. Describes and analyzes properties of subsets of the real numbers (e.g., closure, identities). (*mastery*)
3. Competency 001.G. Uses deductive reasoning to simplify and justify algebraic processes. (*mastery*)
4. Competency 001. H. Demonstrates how some problems that have no solution in the integer or rational number systems have solutions in the real number system. (*practice*)
5. Competency 002.A. Demonstrates how some problems that have no solution in the real

number system have solutions in the complex number system.

6. Competency 002.B. Understands the properties of complex numbers (e.g., complex conjugate, magnitude/modulus, multiplicative inverse).
7. Competency 002.C. Understands the algebraic structure of the complex number system and its subsets (e.g., complex numbers as a field, complex addition as vector addition).
8. Competency 002.D. Selects and uses appropriate representations of complex numbers (e.g., vector, ordered pair, polar, exponential) for particular situations.
9. Competency 002.E. Describes complex number operations (e.g., addition, multiplication, roots) using symbolic and geometric representations.
10. Competency 003.A. Applies ideas from number theory (e.g., prime numbers and factorization, the Euclidean algorithm, divisibility, congruence classes, modular arithmetic, the fundamental theorem of arithmetic) to solve problems.
11. Competency 003.B. Applies number theory concepts and principles to justify and prove number relationships.

Required Reading and Textbook(s)

Elementary Abstract Algebra: Examples and Applications, C. Thron, et al. The textbook is a free open-source text, and is available through Canvas.

COURSE REQUIREMENTS

- Homework (40%) will be assigned on a weekly basis. Solutions will be provided after the due date. Students are expected to self-check. Selected homework questions will be graded for correctness. 30% of the grade will be completion 70% for correctness.
- Discussion (10 %) There will be 5 discussion topics that you will be expected to complete. For each discussion you will be required to talk about a particular problem, and you may need to provide a proof. You will also respond to the other students posts with constructive criticism and feedback.
- Tests (50%). There are 2 tests of weight 25%. Test questions will be similar to the homework questions.

Grading Criteria Rubric and Conversion

Homework	40% (360 points)	90- 100%= A
Discussion	10% (40 points)	80- 89%= B
Test 1	25% (100 points)	70- 79%= C
Test 2	25% (100 points)	60- 69%= D
TOTAL	100% (400 points)	Below 60 % F

Partial credit for homework and test questions will be awarded according to the following guidelines:

- 100% Perfect
- 90% Minor careless or technical mistakes
- 80% Minor procedural error
- 70% Major conceptual or procedural error.
- 60% Makes beginning steps towards a solution
- 30% Some relevant information supplied.

Please note: If your overall grade (on a scale from 0 to 100) is within 1 point of the next highest grade level, I will increase your grade if you have done all of the quizzes. Otherwise you will be graded strictly according to the numbers. That means that if your average is 89.99 and you didn't do all the quizzes, then you still get a B.

Posting of Grades

Homework grades will be posted on Canvas when graded, within 1 week of being turned in. Discussion board posts will be graded. Cumulative grades will be available on Canvas.

Grading Policies

Late work will be accepted only in case of medical or family emergency: in this case, written verification is required, and the maximum makeup grade is 70%. At most 2 late assignments will be accepted.

Missed exams: If you cannot make an exam session, you must schedule an alternative period beforehand. Missed exams must be taken within a week of the actual exam.

Appeals: If the student wishes to appeal a grade, he/she must do so *within 1 week* of receiving the graded paper. Students should save all their work to ensure that no clerical errors are made in grade reporting. Periodically during the semester, I will release a complete record of your grades so far in the class. If I have made a recording error, you may bring the paper to me and I will record it correctly.

COURSE OUTLINE AND CALENDAR

Complete Course Calendar

Complete Course Calendar

***NOTE: Although the following should be fairly close to the actual schedule, some adjustments may be made to the schedule to accommodate the students' learning speed.

Week # (Mon.)	New Material, with associated Student Learning Outcomes (SLO's)
#1(1/16)	Complex numbers (SLO's a-e,h and 002.A,B,C,D)
#2(1/23)	Complex numbers (SLO's a-e,h and 002.A,B,C,D)
#3(1/30)	Modular arithmetic (SLO's a-e,h and 003A,B)
#4(2/6)	Modular arithmetic and divisibility (SLO's g and 003A,B)
#5(2/13)	Sets and functions (SLO's a-f,h)
#6(2/20)	Summation notation and polynomials (SLO's a-e,h)
#7(2/27)	Symmetries (SLO's a-e,g)
#8(3/6)	TEST 1
(3/13)	SPRING BREAK
#9 (3/20)	Permutations (SLO's a-e,g)
#10 (3/27)	Permutations (SLO's a-e,g)
#11 (4/3)	Abstract groups (SLO's a-h)
#12 (4/10)	Abstract groups & Equivalence relations (SLO's a-h)
#13 (4/17)	Equivalence relations (SLO's a-h)
#14 (4/24)	Cosets and quotient groups (SLO's a-h)

#15 (5/1)	Cosets and quotient groups (SLO's a-h)
#16 (5/8)	TEST #2

Important University Dates

Important university dates may be found here:

<https://www.tamuct.edu/registrar/academic-calendar.html>]

TECHNOLOGY REQUIREMENTS AND SUPPORT

Technology Requirements

This course will use the A&M-Central Texas Instructure Canvas learning management system.

We strongly recommend the latest versions of Chrome or Firefox browsers. Canvas no longer supports any version of Internet Explorer.

Logon to A&M-Central Texas Canvas [<https://tamuct.instructure.com/>] or access Canvas through the TAMUCT Online link in myCT [<https://tamuct.onecampus.com/>]. You will log in through our Microsoft portal.

Username: Your MyCT email address. Password: Your MyCT password

Canvas Support

Use the Canvas Help link, located at the bottom of the left-hand menu, for issues with Canvas. You can select "Chat with Canvas Support," submit a support request through "Report a Problem," or call the Canvas support line: 1-844-757-0953.

For issues related to course content and requirements, contact your instructor.

Online Proctored Testing

A&M-Central Texas uses Proctorio for online identity verification and proctored testing. This service is provided at no direct cost to students. If the course requires identity verification or proctored testing, the technology requirements are: Any computer meeting the minimum computing requirements, plus web camera, speaker, and microphone (or headset). Proctorio also requires the Chrome web browser with their custom plug in.

Other Technology Support

For log-in problems, students should contact Help Desk Central, 24 hours a day, 7 days a week

Email: helpdesk@tamu.edu

Phone: (254) 519-5466

[Web Chat](http://hdc.tamu.edu): [<http://hdc.tamu.edu>]

Please let the support technician know you are an A&M-Central Texas student.

UNIVERSITY RESOURCES, PROCEDURES, AND GUIDELINES

Academic Accommodations

At Texas A&M University-Central Texas, we value an inclusive learning environment where

every student has an equal chance to succeed and has the right to a barrier-free education. The Warrior Center for Student Success, Equity and Inclusion is responsible for ensuring that students with a disability receive equal access to the university's programs, services and activities. If you believe you have a disability requiring reasonable accommodations, please contact the Office of Access and Inclusion, WH-212; or call (254) 501-5836. Any information you provide is private and confidential and will be treated as such.

For more information, please visit our [Access & Inclusion](https://tamuct.instructure.com/courses/717) Canvas page (log-in required) [https://tamuct.instructure.com/courses/717]

Academic Integrity

Texas A&M University-Central Texas values the integrity of the academic enterprise and strives for the highest standards of academic conduct. A&M-Central Texas expects its students, faculty, and staff to support the adherence to high standards of personal and scholarly conduct to preserve the honor and integrity of the creative community. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. All academic misconduct concerns will be referred to the Office of Student Conduct. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

For more [information regarding the student conduct process](https://www.tamuct.edu/student-affairs/student-conduct.html), [https://www.tamuct.edu/student-affairs/student-conduct.html].

If you know of potential honor violations by other students, you may [submit a referral](https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=0), [https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=0].

Drop Policy

If you discover that you need to drop this class, you must complete the [Drop Request](#) Dynamic Form through Warrior Web.

[https://federation.ngwebsolutions.com/sp/startSSO.ping?PartnerIdId=https://eis-prod.ec.tamuct.edu:443/samlssso&SpSessionAuthnAdapterId=tamuctDF&TargetResource=https%3a%2f%2fdynamicforms.ngwebsolutions.com%2fSubmit%2fStart%2f53b8369e-0502-4f36-be43-f02a4202f612].

Faculty cannot drop students; this is always the responsibility of the student. The Registrar's Office will provide a deadline on the Academic Calendar for which the form must be completed. Once you submit the completed form to the Registrar's Office, you must go into Warrior Web and confirm that you are no longer enrolled. If you still show as enrolled, FOLLOW-UP with the Registrar's Office immediately. You are to attend class until the procedure is complete to avoid penalty for absence. Should you miss the drop deadline or fail to follow the procedure, you will receive an F in the course, which may affect your financial aid and/or VA educational benefits.

Important information for Pregnant and/or Parenting Students

Texas A&M University-Central Texas supports students who are pregnant, experiencing pregnancy-related conditions, and/or parenting. In accordance with requirements of Title IX and related guidance from US Department of Education's Office of Civil Rights, the Dean of

Student Affairs' Office can assist students who are pregnant and/or parenting in seeking accommodations related to pregnancy and/or parenting. Students should seek out assistance as early in the pregnancy as possible. For more information, please visit [Student Affairs](https://www.tamuct.edu/student-affairs/pregnant-and-parenting-students.html) [https://www.tamuct.edu/student-affairs/pregnant-and-parenting-students.html]. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines](http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf) online, please visit the website [http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf].

Title IX of the Education Amendments Act of 1972 prohibits discrimination on the basis of sex and gender—including pregnancy, parenting, and all related conditions. A&M-Central Texas is able to provide flexible and individualized reasonable accommodation to pregnant and parenting students. All pregnant and parenting students should contact the Associate Dean in the Division of Student Affairs at (254) 501-5909 to seek out assistance. Students may also contact the University's Title IX Coordinator.

Tutoring

Tutoring is available to all A&M-Central Texas students, both virtually and in-person. Student success coaching is available online upon request.

If you have a question, are interested in becoming a tutor, or in need of success coaching contact the Warrior Center for Student Success, Equity and Inclusion at (254) 501-5836, visit the Warrior Center at 212 Warrior Hall, or by emailing WarriorCenter@tamuct.edu.

To schedule tutoring sessions and view tutor availability, please visit [Tutor Matching Services](https://tutormatchingservice.com/TAMUCT) [https://tutormatchingservice.com/TAMUCT] or visit the Tutoring Center in 111 Warrior Hall.

Chat live with a remote tutor 24/7 for almost any subject from on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log in and receive online tutoring support at no additional cost. This tool provides tutoring in over 40 subject areas except writing support. Access Tutor.com through Canvas.

University Library & Archives

The University Library & Archives provides many services in support of research across campus and at a distance. We offer over 350 electronic databases containing approximately 631,525 eBooks and 75,149 journals, in addition to the 97,443 items in our print collection, which can be mailed to students who live more than 50 miles from campus. Research guides for each subject taught at A&M-Central Texas are available through our website to help students navigate these resources. On campus, the library offers technology including cameras, laptops, microphones, webcams, and digital sound recorders.

Research assistance from a librarian is also available 24 hours a day through our online chat service, and at the reference desk when the library is open. Research sessions can be scheduled for more comprehensive assistance, and may take place virtually through WebEx, Microsoft Teams or in-person at the library. [Schedule an appointment here](https://tamuct.libcal.com/appointments) [https://tamuct.libcal.com/appointments]. Assistance may cover many topics, including how to find articles in peer-reviewed journals, how to cite resources, and how to piece together

research for written assignments.

Our 27,000-square-foot facility on the A&M-Central Texas main campus includes student lounges, private study rooms, group work spaces, computer labs, family areas suitable for all ages, and many other features. Services such as interlibrary loan, TexShare, binding, and laminating are available. The library frequently offers workshops, tours, readings, and other events. For more information, please visit our [Library website](https://tamuct.libguides.com/index) [https://tamuct.libguides.com/index]

University Writing Center

University Writing Center: Located in Warrior Hall 416, the University Writing Center (UWC) at Texas A&M University–Central Texas (A&M–Central Texas) is a free service open to all A&M–Central Texas students. The hours of operation are from 10:00 a.m.-5:00 p.m. Monday thru Thursday in Warrior Hall 416 (with online tutoring available every hour as well) with satellite hours available online only Monday thru Thursday from 6:00-9:00 p.m. and Saturday 12:00-3:00 p.m.

Tutors are prepared to help writers of all levels and abilities at any stage of the writing process. While tutors will not write, edit, or grade papers, they will assist students in developing more effective composing practices. By providing a practice audience for students' ideas and writing, our tutors highlight the ways in which they read and interpret students' texts, offering guidance and support throughout the various stages of the writing process. In addition, students may work independently in the UWC by checking out a laptop that runs the Microsoft Office suite and connects to WiFi, or by consulting our resources on writing, including all of the relevant style guides. Whether you need help brainstorming ideas, organizing an essay, proofreading, understanding proper citation practices, or just want a quiet place to work, the UWC is here to help!

Students may arrange a one-to-one session with a trained and experienced writing tutor by making an appointment via [WConline](https://tamuct.mywconline.com/) [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at bruce.bowles@tamuct.edu if you have any questions about the UWC, need any assistance with scheduling, or would like to schedule a recurring appointment with your favorite tutor.

OTHER POLICY STATEMENTS

A Note about Sexual Violence at A&M-Central Texas

Sexual violence is a serious safety, social justice, and public health issue. The university offers support for anyone struggling with these issues. University faculty are mandated reporters, so if someone discloses that they were sexually assaulted (or a victim of Domestic/Dating Violence or Stalking) while a student at TAMUCT, faculty members are required to inform the Title IX Office. If you want to discuss any of these issues confidentially, you can do so through Student Wellness and Counseling (254-501-5955) located on the second floor of Warrior Hall (207L).

Sexual violence can occur on our campus because predators often feel emboldened, and

victims often feel silenced or shamed. It is incumbent on ALL of us to find ways to actively create environments that tell predators we don't agree with their behaviors and tell survivors we will support them. Your actions matter. Don't be a bystander; be an agent of change. For additional information on campus policy and resources visit the [Title IX webpage](https://www.tamuct.edu/compliance/titleix.html) [https://www.tamuct.edu/compliance/titleix.html].

Behavioral Intervention

Texas A&M University-Central Texas cares about the safety, health, and well-being of its students, faculty, staff, and community. If you are aware of individuals for whom you have a concern, please make a referral to the Behavioral Intervention Team. Referring your concern shows you care. You can complete the [referral](https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=2) online

[https://cm.maxient.com/reportingform.php?TAMUCentralTexas&layout_id=2].

Anonymous referrals are accepted. Please see the [Behavioral Intervention Team](https://www.tamuct.edu/bit) website for more information [https://www.tamuct.edu/bit]. If a person's behavior poses an imminent threat to you or another, contact 911 or A&M-Central Texas University Police at 254-501-5805.

Copyright Notice

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