

## **MTHK 4332-110 ABSTRACT ALGEBRA**

Spring 2018 rev. 1.15.2018

Texas A&M University - Central Texas

### **INSTRUCTOR AND CONTACT INFORMATION**

Instructor: Chris Thron

Office: Warrior Hall 420C

Phone: (512) 293 0715 (cell) (254) 519 5776 (office) *Note: I will be out of the country until Spring break, so I won't be available by phone before then.*

Email: [thron@tamuct.edu](mailto:thron@tamuct.edu)

Skype: christopher.thron

Assistant: Katrina Weis

Email: [kw027@my.tamuct.edu](mailto:kw027@my.tamuct.edu)

Phone: 254 258 0839

Skype: [kw027@my.tamuct.edu](https://www.skype.com/people/kw027@my.tamuct.edu) (the one with the picture)

### **Office Hours:**

Two Skype office hour sessions will be arranged. Suggested hours are Monday and Friday at 9:30 a.m. ***Students should have a computer with microphone and speakers, with Skype installed.***

Katrina's office hours are: Tuesdays and Thursdays from 2-4 p.m. in Warrior Hall 420 N

### **Mode of instruction and course access:**

This is a web-enhanced course, which includes significant classroom and web-based components.

Course materials, notifications, and email communications will use Canvas [<https://canvas.instructure.com>]

Course grades will be posted in the A&M-Central Texas Canvas [<https://tamuct.instructure.com>].

Homework will be turned in on GradeScope ([www.gradescope.com](http://www.gradescope.com))

### **911 Cellular:**

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

911Cellular is an emergency notification service that gives Texas A&M University-Central Texas the ability to communicate health and safety emergency information quickly via email, text message, and social media. All students are automatically enrolled in 911 Cellular through their myCT email account.

Connect at [911Cellular](https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management) [<https://portal.publicsafetycloud.net/Texas-AM-Central/alert-management>] to change where you receive your alerts or to opt out. By staying enrolled in 911Cellular, university officials can quickly pass on safety-related information, regardless of your location.

**Course Overview and description:** Important basic examples and ideas of abstract algebra, including: equivalence relations and equivalence classes; symmetries and symmetry groups; permutations; group axioms and basic properties; 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 linear algebra-related skills that are necessary to pass the Texas teacher certification exam for 7-12 mathematics.

**Required Reading and Textbook(s):**

All materials are online:

- Online interactive textbook (<http://sl2x.aimath.org/book/aafmt/>)
- pdf text (free) and print textbook (optional): available at [abstractalgebra.altervista.org](http://abstractalgebra.altervista.org)
- Youtube videos (<https://www.youtube.com/playlist?list=PL2uooHqQ6T7PW5na4EX8rQX2WvBBdM8Qo>)

**COURSE REQUIREMENTS**

- Homework/quizzes (60%) Homework will be submitted approximately once a week on Gradescope.
- Tests (40%). There are 2 tests of weight 20%. Each test will occupy 2 class periods. Test questions will be similar to the homework questions.
- If your overall point total is within 1 point of the next highest grade level, I will increase your grade if you have turned in all assigned work. Otherwise, I will go strictly by the numbers. That means that if your average is 89.99 and you didn't do all the homework, you'll still get a B.

**Grading Criteria Rubric and Conversion**

		90-100%=A
Homework	60%	80- 89%= B
Test1	20%	70- 79%= C

Test 2	20%	60- 69%= D
TOTAL	100%	Below 60 % F

Partial credit for quiz and test questions will be awarded as follows:

- 100% Perfect
- 95% Minor careless or technical mistakes
- 90% Minor procedural error
- 80% Conceptual error or major procedural error.
- 70% Major conceptual error
- 60% Makes beginning steps towards a solution
- 30% Some relevant information supplied.

### Posting of Grades

- Homework grades will be posted on Gradescope when graded. Cumulative grades will be posted on TAMUCT canvas after each test.

### COURSE OUTLINE AND CALENDAR

Note that the detailed list of assignments and exact due dates will be posted on Blackboard. In general, homework will be due on the Thursday of the week following the assignment

- Week 1&2(1/14,1/21): Symmetries of plane figures (Homework due 1/30)
- Weeks 2,3,4 (1/21,1/28, 2/4): Permutations (Homework due 2/13)
- Week 5&6 (2/11,2/18) Abstract groups (HW due 2/27)
- Week 7 (2/25) Equivalence relations and equivalence classes
- Week 8 (3/4): Test 1 (both class periods; covers all previous material)
- 3/11 SPRING BREAK
- Weeks 9&10 (3/18,3/25) Normal subgroups and cosets (HW due 4/3)
- Weeks 11&12(4/1,4/8) Isomorphisms and Homomorphisms (HW due 4/17)
- Week 13,14,15 (4/15,4/22,4/29) Group actions (Hw due 5/3)
- Week 16 Test 2 (both class periods)

### INSTRUCTOR GRADING POLICIES

**Late work:** Please count on submitting your homework on time. I have found by experience that it is not helpful to the student to grant extensions, and it ends up wasting a lot of my time as well. In case of medical or family emergency, written verification is required, and the maximum makeup grade is 65% (due to overhead cost).

**Missed exams:** If you cannot make an exam session, you must schedule an alternative period beforehand. Missed exams must be taken within 5 days 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.

*The following material is generic for all TAMUCT courses, and does not contain specific*

*information for this course.*

**Important University Dates:**

**January 2018**

January 2, (Tuesday) Winter Break Ends  
January 2, (Tuesday) Priority Deadline for Admissions applications  
January 5, (Friday) VA Certification Request Priority Deadline  
January 11, (Thursday) Convocation  
January 12, (Friday) Tuition and Fee payment deadline (16 week & 1st 8 week)  
January 15, (Monday) Martin L. King Jr. Day  
January 16, (Tuesday) ADD/DROP/LATE REGISTRATION BEGINS (\$25 fee assessed for late registrants) (16 week & 1st 8 week)  
January 16, (Tuesday) Classes Begins  
January 18, (Thursday) ADD/DROP/LATE REGISTRATION ENDS (16 week & 1st 8 week)  
January 23, (Tuesday) Last day to drop 1st 8-week classes with no record  
January 31, (Wednesday) Last day to drop 16 week classes with no record

**February 2018**

February 2, (Friday) Priority Deadline to Submit Graduation Application  
February 9, (Friday) Last day to drop a 1st 8-week class with a Q or withdraw with a W  
February 15, (Thursday) Last day to apply for Clinical Teaching  
February 23, (Friday) Student End of Course Survey Opens (1st 8-Week Classes)

**March 2018**

March 1, (Thursday) Deadline to submit application to Teacher Education Program  
March 2, (Thursday) Deadline to Submit Graduation Application for Ceremony Participation  
March 9, (Friday) 1st 8 week classes end  
March 9, (Friday) Deadline for Admissions applications  
March 11, (Sunday) Student End of Course Survey Closes (1st 8-Week Classes)  
March 12, (Monday) Spring Break Begins  
March 12, (Monday) 1st 8-week grades from faculty due by 3pm  
March 15, (Thursday) Tuition and Fee Payment Deadline (2nd 8-week classes)  
March 16, (Friday) Spring Break Ends  
March 19, (Monday) 2nd 8 week begins  
March 19, (Monday) Summer Advising Starts  
March 19, (Monday) Class Schedule Published  
March 19, (Monday) ADD/DROP/LATE REGISTRATION BEGINS (\$25 fee assessed for late registrants) (2nd 8-week classes)  
March 21, (Wednesday) ADD/DROP/LATE REGISTRATION ENDS (2nd 8-week classes)  
March 27, (Tuesday) Last day to drop 2nd 8-week classes with no record  
March 30, (Friday) Last day to drop a 16-week course with a Q or withdraw with a W

**April 2018**

April 1, (Sunday) GRE/GMAT scores due to Office of Graduate Studies  
April 2, (Monday) Scholarship Deadline

April 2, (Monday) Registration begins  
April 5, (Thursday) Priority Deadline for International Student Admission Applications  
April 13, (Friday) Last day to drop a 2nd 8-week class with a Q or withdraw with a W\*  
April 13, (Friday) Deadline for submission of final committee-edited theses with committee approval signatures to Office of Graduate Studies  
April 27, (Friday) Student End of Course Survey Opens (16 Week and 2nd 8-Week Classes)

### **May 2018**

May 7-11, Finals Week  
May 11, (Friday) Last day to file for Degree Conferral (Registrar's Office)(\$20 Late Application Fee applies)  
May 11, (Friday) Spring Term Ends  
May 11, (Friday) Last day to withdraw from the university (16 week and 2nd 8 week classes)  
May 11, (Friday) Last day to apply for \$1000 Tuition Rebate for Spring graduation (5pm)  
May 12, (Saturday) Commencement Ceremony Bell County Expo Center 7:00 p.m.  
May 13, (Sunday) Student End of Course Survey Closes (16 Week and 2nd 8-Week Classes)  
May 14, (Monday) Minimester begins  
May 15, (Tuesday) Last Day to clear Thesis Office  
May 5, (Tuesday) Final grades due from faculty by 3pm (16 week & 2nd 8 week)  
May 21, (Monday) Priority Deadline for Admissions applications  
May 25, (Friday) VA Certification Request Priority Deadline  
May 28, (Monday) Memorial Day

## TECHNOLOGY REQUIREMENTS AND SUPPORT

### **Technology Requirements**

This course will use the A&M-Central Texas Instructure Canvas learning management system. Logon to A&M-Central Texas Canvas [<https://tamuct.instructure.com>].

Username: Your MyCT username (xx123 or everything before the "@" in your MyCT e-mail 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.

### **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](mailto: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

### **Drop Policy.**

If you discover that you need to drop this class, you must complete a [Drop Request Form](https://www.tamuct.edu/registrar/docs/Drop_Request_Form.pdf) [https://www.tamuct.edu/registrar/docs/Drop\_Request\_Form.pdf].

Professors 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, signed and returned. Once you return the signed 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.

### **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. Academic integrity is defined as a commitment to honesty, trust, fairness, respect, and responsibility. Any deviation by students from this expectation may result in a failing grade for the assignment and potentially a failing grade for the course. Academic misconduct is any act that improperly affects a true and honest evaluation of a student's academic performance and includes, but is not limited to, cheating on an examination or other academic work, plagiarism and improper citation of sources, using another student's work, collusion, and the abuse of resource materials. All academic misconduct concerns will be reported to the university's Office of Student Conduct. Ignorance of the university's standards and expectations is never an excuse to act with a lack of integrity. When in doubt on collaboration, citation, or any issue, please contact your instructor before taking a course of action.

### **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 Department of Access 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 Department of Access and Inclusion at (254) 501-5831. Any information you provide is private and confidential and will be treated as such.

For more information please visit our [Access & Inclusion](https://www.tamuct.edu/student-affairs/access-inclusion.html) webpage [https://www.tamuct.edu/student-affairs/access-inclusion.html].

Texas A&M University-Central Texas supports students who are pregnant and/or parenting. In accordance with requirements of Title IX and 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. For more information, please visit <https://www.tamuct.departments/index.php>. Students may also contact the institution's Title IX Coordinator. If you would like to read more about these [requirements and guidelines 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 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 on-campus and online. On-campus subjects tutored include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111. If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or any other question, contact Academic Support Programs at 254-519-5796, or by emailing Dr. DeEadra Albert-Green at [deeadra.albertgreen@tamuct.edu](mailto:deeadra.albertgreen@tamuct.edu).

Chat live with a tutor 24/7 for almost any subject on your computer! Tutor.com is an online tutoring platform that enables A&M-Central Texas students to log-in and receive FREE online tutoring and writing support. This tool provides tutoring in over forty subject areas. Access Tutor.com through Canvas.

**University Writing Center:** Located in 416 Warrior Hall, the University Writing Center (UWC) at Texas A&M University-Central Texas is a free workspace open to all TAMUCT students from 10am-5pm Monday-Thursday with satellite hours in the University Library Monday-Thursday from 6:00-9:00pm. Students may arrange a one-on-one session with a trained and experienced writing tutor by visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via [WOnline](#) at [<https://tamuct.mywconline.com/>]. In addition, you can email Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu) to schedule an online tutoring session. 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 University Writing Center is here to help!

If you have any questions about the University Writing Center, please do not hesitate to contact Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu).

### **University Library.**

The University Library provides many services in support of research across campus and at a distance. We offer over 200 electronic databases containing approximately 250,000 eBooks and 82,000 journals, in addition to the 72,000 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 twenty-four 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 on Skype or in-person at the library. 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/) [https://tamuct.libguides.com/].

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### OPTIONAL 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 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/departments/compliance/titleix.php) [<https://www.tamuct.edu/departments/compliance/titleix.php>].

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 twenty-four 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 on Skype or in-person at the library. 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.

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