

## **MATH 3301-120, CRN 80592 Number Theory**

**Fall 2019 rev. 08.11.19**

Texas A&M University-Central Texas

### **COURSE DATES, MODALITY, AND LOCATION**

Aug 26, 2019 - Dec 13, 2019

Class time for this course 11 am - 12:15 pm Tuesdays and Thursdays, Founder's Hall 310.

### **INSTRUCTOR AND CONTACT INFORMATION**

**Instructors:** Jordan Barry and Christopher Thron

**Office:** (Barry) TBA (Thron) 302J Heritage Hall

**Phone:** (Thron) (585) 204-0314

**Email:** Please email instructors via Canvas email.

**Google Hangouts** (for online office hours): [chris.thron@gmail.com](mailto:chris.thron@gmail.com)

### **Office Hours**

(Barry): Tuesdays after class (in classroom)

(Thron): Tuesdays and Thursdays 12:30-1:30 (office hours will be online via Google Hangouts until Oct 7). Online weekend office hours (via Google Hangouts) will be announced.

### **Student-instructor interaction**

Students are encouraged and expected to make full use of modern communications technology to contact instructors. Most careers that involve engineering require constant and effective use of electronic communication—so get used to it now! If you get stuck on a concept or homework problem, you can text or email any time day or night. It's helpful if you send a screen shot of your work so far. The instructor may be able to get right on Google Hangouts and provide support.

Students are also encouraged and expected to communicate with and help each other. Note that helping does NOT mean copying. You all know the difference between discussing a problem and having one person do the problem and the other copy.

### **WARRIOR SHIELD**

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

Warrior Shield 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 Warrior Shield through their myCT email account.

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

## **COURSE INFORMATION**

### **Course Overview and description**

#### **Course Objective**

This class will familiarize you with number systems and techniques that will enable you to solve problems and prove statements involving algebraic properties of numbers. It is a prelude to abstract algebra, which takes these concepts to the next level of abstraction. You will also be exposed to practical applications of the material, principally cryptography.

#### **Student Learning Outcomes**

Upon successfully completing MATH 3301, students should be able to do the following:

1. comprehend and apply definitions of abstract algebraic concepts;
2. state and write rigorous proofs of related mathematical theorems according to the standards of mathematics;
3. perform computations related to the material;
4. demonstrate the use of the theoretical results and computational aspects on required applications; and
5. connect the material to other courses.

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

All materials are online. The main resource is:

Hill and Thron (eds.), Elementary Abstract Algebra: Examples and Applications

The text main web page is:

[abstractalgebra.altervista.org](http://abstractalgebra.altervista.org)

Text is available in .pdf, .html, and print versions. It is recommended that you use the HTML text.

The .pdf and .html versions have links to videos on YouTube. The entire playlist is here:

<https://www.youtube.com/playlist?list=PL2uooHgQ6T7PW5na4EX8rQX2WvBBdM8Qo>

## **COURSE REQUIREMENTS AND GRADING**

There will be 12 quizzes, which cover the material covered the previous week. Each quiz counts 50 points. There is also a final exam that counts 300 points. The course total is 900 points. Makeup quizzes must be completed within 1 week of the assigned date—usually, makeup quizzes will be completed at the next class session. At most 3 makeup quizzes will be permitted.

A: 90.0-100%; B: 80-89.9%; C: 70-79.9%; D: 60-69.9%

*Students within one point of the next grade level will have their grades bumped up if they complete all assignments.*

## Posting of Grades

Quizzes will be graded within one week, and results posted on Canvas.

## COURSE OUTLINE AND CALENDAR

### Complete Course Calendar

*Assignments are listed with the student learning outcomes (SLO) that they address*

August 27: Chapter 1, preliminaries (SLO 3)

September 3: Quiz on previous week; Complex numbers (2.1-2.3) (SLO 1-5)

September 10: Quiz on previous week; Complex numbers (2.4-2.5) (SLO 1-5)

September 17: Quiz on previous week; Modular Arithmetic (3.1-3.3) (SLO 1-5)

September 24: Quiz on previous week; Modular Arithmetic (3.4-3.5) (SLO 1-5)

October 1: Quiz on previous week; Set Theory (4.1-4.2) (SLO 1,2,3,5)

October 8: Quiz on previous week; Functions (5.1-5.3) (SLO 1,2,3,5)

October 15: Quiz on previous week; Functions (5.4-5.5) (SLO 1,2,3,5)

October 22: Quiz on previous week; Introduction to Cryptography (6.1-6.2) (SLO 3-5)

October 29: Quiz on previous week; Introduction to Cryptography (6.3) (SLO 13-5)

November 5: Quiz on previous week; Sigma notation (7.1-7.3) (SLO 1,3,4,5)

November 12: Quiz on previous week; Sigma notation (7.3-7.5) (SLO 1,3,4,5)

November 19: Quiz on previous week; Polynomials (8.1-8.2) (SLO 1-5)

November 26: Polynomials (8.3-8.6) (SLO 1-5)

December 3: Review

December 10: Final exam.

### Important University Dates

See the TAMUCT Academic Calendar: <https://www.tamuct.edu/registrar/academic-calendar.html>]

## TECHNOLOGY REQUIREMENTS AND SUPPORT

### Technology Requirements

Since course materials are exclusively online, home access to a computer, tablet, or smart phone with Internet connection is required. Since office hours are largely online, your computing device should be equipped with audio (microphone and speakers/headphone).

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/>] 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.

### **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.

For more [information regarding the Student Conduct process](#),

[<https://www.tamuct.edu/student-affairs/student-conduct.html>].

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

### **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 Office 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 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](#) Canvas page (log-in required) [<https://tamuct.instructure.com/courses/717>]

### **Important information for Pregnant and/or Parenting Students**

Texas A&M University-Central Texas supports students who are pregnant 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/index.html) [<https://www.tamuct.edu/student-affairs/index.html>]. 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 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 on-campus and online. Subjects tutored on campus include Accounting, Advanced Math, Biology, Finance, Statistics, Mathematics, and Study Skills. Tutors are available at the Tutoring Center in Warrior Hall, Suite 111. Tutor.com tutoring **will not** offer writing support beginning August 1, 2019.

If you have a question regarding tutor schedules, need to schedule a tutoring session, are interested in becoming a tutor, or have 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 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. Access Tutor.com through Canvas.

### **University Writing Center**

Located in Warrior Hall 416, the University Writing Center (UWC) at Texas A&M University–Central Texas (TAMUCT) is a free workspace open to all TAMUCT students from 10:00 a.m.-5:00 p.m. Monday thru Thursday with satellite hours in the University Library Monday thru Thursday from 6:00-9:00 p.m. This semester, the UWC is also offering online only hours from 12:00-3:00 p.m. on Saturdays.

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 visiting the UWC during normal operating hours (both half-hour and hour sessions are available) or by making an appointment via [WOnline](https://tamuct.mywconline.com/) [https://tamuct.mywconline.com/]. In addition, you can email Dr. Bruce Bowles Jr. at [bruce.bowles@tamuct.edu](mailto:bruce.bowles@tamuct.edu) if you have any questions about the UWC and/or need any assistance with scheduling.

### **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 85,000 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 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 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](http://tamuct.libguides.com/index) [http://tamuct.libguides.com/index].

---

## **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].

### **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, who are exhibiting behaviors that pose a threat to safety, or individuals causing a significant disruption to our community, please make a referral to the Behavioral Intervention Team. 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/student-affairs/bat.html) website for more information [https://www.tamuct.edu/student-affairs/bat.html]. If a person's behavior poses an imminent threat to you or another, contact 911 or A&M-Central Texas University Police at 254-501-5800.

---