

Texas A&M University, Central Texas, Fall 2017
MATH 3360: Numerical Analysis
Instructor: Chris Thron

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Good communication is the key to success. Please *don't hesitate* to contact me. I have small classes this semester, so I have time to talk to you! I'm in the Tuesday and Thursday afternoons, and Wednesday all day. (It's best to let me know first that you're coming). Apart from that, please take advantage of the miracle of modern communication:

- Call my cell phone any time between 9 a.m.- 9 p.m. Leave a message if I don't answer.
- Email me any time. Typically I answer emails within 1-2 hours.
- If you text me, It's better to text both my cell phone and email. My main platform is computer– I don't have a smart phone
- If you see me on Skype, please feel free to call. Skype is especially effective because we can share screens.

1 Course Overview:

An introduction to numerical analysis. Topics will be selected from error analysis, solving algebraic equations, interpolation, numerical differentiation and integration, methods for solving systems of equations, approximation theory, and initial value problems of ordinary differential equations.

Prerequisite: MATH 209 (Calculus 2) and 3 hours CS.

2 Competency Goal Statements:

Students will:

- Demonstrate an understanding of the derivation of and motivation for numerical algorithms.
- Choose an appropriate technique for a given problem and apply the technique successfully.
- Implement numerical algorithms using software
- Interpret the results of numerical algorithms and discuss the accuracy of the results.

3 Course Delivery:

This class is officially listed as a “Web-enhanced” lecture course (11-49% online activity). The class will meet twice a week throughout the semester (except when the instructor is out of town). The class follows a “flipped” format, in which lectures are available by video and class time is devoted to interactive activities.

This course uses the A&M-Central Texas Canvas Learning Management System:

<https://tamuct.instructure.com>

4 Required Materials

See “Course Guide” on Canvas

5 Course Requirements

- Canvas homework (30%) These are automatically graded assignments, and are designed to reinforce fundamental concepts and prepare you for the Testing Center quizzes (below).
- Testing Center quizzes (30%) These are done in the testing center, and are intended to evaluate

- your mastery of the concepts and procedures that are covered in the Canvas homework..
- Spreadsheet projects (40%). You will construct formatted spreadsheets that perform various specific numerical analysis tasks.

Please note:

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.

6 Grading Policies

Late work will be accepted only in case of medical or family emergency, and written verification is required. The only exception to this rule is when I extend the deadline for the entire class. Even when written verification is given, the maximum grade for late work is 70%.

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.

Partial credit for homework/quiz/exam questions will be awarded as follows:

100% Perfect, or inessential misprints

90% Shows complete understanding of the underlying concept or procedure -- careless, minor or technical mistakes

75% General understanding of the underlying concept or procedure -- significant progress towards solution (more than 75% complete)

50% Makes some progress towards solution (problem setup and some application of relevant principles)

25% Shows some familiarity with relevant concepts

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.

7 Student Concerns

In general, student concerns about this course should be addressed to the instructor. If the student wants to remain confidential, concerns may be raised with the Dean of Arts and sciences, who will guarantee confidentiality.

8 Syllabus Updates

During the course of the semester, the instructor may find it necessary to modify certain portions of this syllabus. The instructors will only make modifications that he feels are necessary to ensure that the students learn the material well. Students will be notified via email if the syllabus is updated. The syllabus posted on Canvas will always be updated to be current.

9 Agreement

By taking this class, the student signifies his/her agreement to abide by all the conditions of this syllabus.

10 Course Calendar Fall 2016

For detailed descriptions of concepts, competencies, and assignments, refer to the "Course Guide" which is on Canvas.

- Quiz homework is submitted on Canvas. You get 5 attempts ; homework is graded automatically. Spreadsheets are submitted on Dropbox.
- All spreadsheets will be included within a single workbook, with different tabs indicating the different assignments. Put tabs in reverse order, so the most recent assignment is the first tab.

<i>Chapter</i>	<i>Item due</i>	<i>Due date (@ midnight)</i>
EXCEL BASICS worksheets	EXCEL BASICS	Sep. 2 (Sat)
Chapter 01.01: Introduction	Quiz 1.02(1)	Sep. 9 (Sat.)
Chapter 01.01: Introduction	Quiz 1.02 (2)	Sep. 9 (Sat.)
Chapter 01.03: Sources of Error	Quiz 1.03(1)	Sep. 9 (Sat.)
Chapter 01.03: Sources of Error	Quiz 1.03(2)	Sep. 9 (Sat.)
Chapter 01.04: Binary representation	Quiz 1.04	Sep. 9 (Sat.)
Chapter 01.05: Floating Point Representation	Quiz Chapter 1.05	Sep. 16 (Sat.)
Chapter 01.05: Floating Point Representation	Spreadsheet Ex1 (Binary & floating-point rep)	Sep. 16 (Sat.)
Chapter 01.06: Propagation of errors	Quiz Chapter 1.06	Sep. 23 (Sat.)
Chapter 01.06: Propagation of errors	Propagation of Errors spreadsheet exercises	Sep. 23 (Sat.)
Chapter 01.07: Taylor series revisited	Quiz 1.07	Sep. 30 (Sat.)
Chapter 01.07: Taylor series revisited	Taylor series spreadsheet exercises	Sep. 30 (Sat.)
Chapter 02.01: Primer on Differential Calculus	Quiz chapter 2.01	Oct. 7 (Sat.)
Chapter 02.02: Diff. of continuous functions	Quiz chapter 2.02	Oct. 7 (Sat.)
Chapter 02.02: Diff. of continuous functions	Diff. of cts. fns spreadsheet exercises	Oct. 7 (Sat.)
Quiz (testing center)		Oct. 14 (Sat.)
Chapter 02.03: Differentiation of Discrete Functions	Quiz chapter 2.03	Oct. 21 (Sat.)
Chapter 03.03: Bisection method	Quiz chapter 3.03	Oct. 21 (Sat.)
Chapter 03.03: Bisection method	Bisection method spreadsheet exercises	Oct. 21 (Sat.)
Chapter 03.04: Newton-Raphson method	Quiz 3.04	Oct. 28 (Sat.)
Chapter 03.04: Newton-Raphson method	Newton's method spreadsheet exercises	Oct. 28 (Sat.)
Chapter 03.05: Secant method	Quiz Chapter 3.05	Nov. 4 (Sat.)
Chapter 03.05: Secant method	Secant method spreadsheet exercises	Nov. 4 (Sat.)
Chapter 04.02: Gaussian elimination	Quiz Chapter 4.02	Nov. 11 (Sat.)
Chapter 04.03: Gauss-Seidel method	Quiz Chapter 4.03	Nov. 11 (Sat.)
Chapter 05.03 Newton's divided difference method	Quiz Chapter 5.03	Nov. 18 (Sat.)
Chapter 05.03 Newton's divided difference method	Newton's divided diff. spreadsheet exercises	Nov. 18 (Sat.)
Chapter 07.02: Trapezoidal Rule of Integration	Quiz 7.02	Dec. 2 (Sat)
Chapter 07.03: Simpson's 1/3rd Rule	Quiz 7.03	Dec. 2 (Sat)
Chapter 07.04: Romberg Rule of Integration	Quiz 7.04	Dec. 2 (Sat)
Chapter 08.02: Euler's method	Quiz 8.02	Dec. 9 (Sat)
Chapter 08.02: Euler's method	Euler's method spreadsheet exercises	Dec. 9 (Sat)
Quiz (testing center)		Dec. 16 (Sat)

11 Standard syllabus stuff

The following is standard university material which you've probably seen in other course syllabi at TAMUCT.

Important University Dates:

August 28, Add/Drop/Late Registration begins
August 30, Add/Drop/Late Registration ends, 16-week and 1st 8-week classes
September 1, Priority Deadline to Submit Graduation Application
September 4, Labor Day, CAMPUS CLOSED
September 5, Last day to drop 1st 8-week classes with no record
September 13, Last day to drop 16-week classes with no record
September 22, Last day to drop a 1st 8-week class with a Q or withdraw with a W
October 6, Deadline to submit graduation
October 20, Last day to withdraw from the University (1st 8-week classes WF)
October 23, Add/Drop/Late Registration begins, 2nd 8-week classes
October 26, Add/Drop/Late Registration ends, 2nd 8-week classes
October 30, Last day to drop 2nd 8-week classes with no record
November 10, Veteran's Day
November 10, Last day to drop with a Q or withdraw with a W (16-week classes)
November 17, Last day to drop a 2nd 8-week class with a Q or withdraw with a W
November 23-24, Thanksgiving, CAMPUS CLOSED
December 15, Last day to withdraw from the University (16-week and 2nd 8-week classes)
December 15, Last day to file for Degree Conferral (Registrar's Office)
December 15, Commencement (End of Fall Term)
December 25-January 1, WINTER BREAK

TECHNOLOGY_REQUIREMENTS AND SUPPORT

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

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>]

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

For issues with Canvas, select “chat with Canvas support,” submit a support request to Canvas Tier 1, or call the Canvas support line: 1-844-757-0953, links to all are found inside of Canvas using the “Help” link.

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

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].

Professors cannot drop students; this is always the responsibility of the student. The Registrar’s Office will provide a deadline on the University 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 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>].

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 Larry Davis at lmDavis@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.

The 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 on Mondays 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 [<https://tamuct.mywconline.com/>]. In addition, you can email Dr. Bruce Bowles Jr. at 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.

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/>].