

CIS 4340-110, 10114, Analysis of Algorithms

Spring 2019

Texas A&M University-Central Texas

COURSE DATES, MODALITY, AND LOCATION

The class dates are January 15, 2019 to May 7, 2019.

This is a face to face course that uses the A&M-Central Texas Canvas Learning Management System [<https://tamuct.instructure.com/>].

INSTRUCTOR AND CONTACT INFORMATION

Instructor: Dr. Timothy G. Woodcock

Office: 323G Founders Hall

Phone: 254-519-5783

Email: Please only use this email. WoodcockTG@tamuct.edu I will not check Canvas email or respond to Canvas email.

Office Hours:

Office Hours are Monday thru Thursday from Noon to 2pm and by appointment.

Mode of instruction and course access:

This course is an online class with some supplemental readings made available online using the TAMUCT Canvas Learning Management System: [<https://tamuct.instructure.com/>] Homework will be assigned, collected, and graded in Canvas.

Student-instructor interaction:

I prefer that you do not phone me. I will check email often Monday through Thursday.

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 911Cellular through their myCT email account.

In an effort to enhance personal safety on the Texas A&M University – Central Texas (TAMUCT) campus, the TAMUCT Police Department has introduced Warrior Shield by 911

Cellular. [Warrior Shield](https://www.tamuct.edu/police/911cellular.html) [<https://www.tamuct.edu/police/911cellular.html>] can be downloaded and installed on your mobile device from Google Play or Apple Store.

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 INFORMATION

Course Overview and description:

- **COSC 4340 Analysis of Algorithms**
- Study modern computer algorithms with emphasis on how to select the best algorithm for a task considering the specific computing environment. Examine searching and sorting algorithms for their importance in computing.
- Special emphasis on efficiency, readability, maintainability, advanced design and analysis techniques, advanced data structures, and graph algorithms.
- Prerequisite(s): [COSC 3351](#) or concurrent enrollment or permission of department chair

Course Objective:

Student Learning Outcomes:

Student learning outcomes should be made explicit at the course level, and by best practice, at the module/unit level, as well.

Competency Goals Statements (certification or standards):

If included in your course

Required Reading and Textbook(s):

“Foundations of Algorithms” Neapolitan

COURSE REQUIREMENTS

Course Requirements: (include point values for each- not just a percentage)

- Calculate the theoretical relative efficiency of sorting algorithms with emphasis on "divide and conquer" sorts such as the quick sort.
- Calculate the actual relative efficiency of advanced sorting algorithms.
- Contrast the "divide and conquer" approach with other solutions to programming problems.
- Employ recursion as it applies to binary search and quick sort.
- Diagram graphs as mathematical representations of networks. Review graph manipulation algorithms including spanning tree and shortest path traversal algorithms. Implement a program to find the shortest path in a graph.
- Contrast the use of heuristic methods as "good enough" methods to attack otherwise unsolvable problems.
- Apply the "NP-Completeness" theorem to the identification of intractable problems.
- Evaluate Finite State Automata, Push Down Automata, and Turing Machines as models of computers executing algorithms.

Grading Criteria Rubric and Conversion

Course Requirements: (include point values for each- not just a percentage)

- There will be two exams, a midterm, and a final, each worth 100 points.
- There will be four projects that the students will build. Two of the projects will be

algorithm performance and two will be formal language automata. The students will turn in a written report as well as the program.

Grading Criteria Rubric and Conversion

Assignment	Total Points
Mid-term Exam	200
Final Exam	200
Projects	600

Grade	Points
A	900-1000
B	800-899
C	700-799
D	600-699
F	Below 600

Posting of Grades

Grades will be posted in Canvas within 2 weeks of the due date

Complete Course Calendar

Algorithms

Week	Date	Book Chapter	Assignments
1	1/15/2019	Chapter 1	
2	1/22/2019	Appendix: B Sections B.1, B.3	
3	1/29/2019	Chapter 2 Sections 2.1-2.5, 2.8	Assignment 1
4	2/5/2019	Chapter 3 Sections 3.1-3.4, 3.6	
5	2/12/2019	Chapter 4 Sections 4.1, 4.2, 4.4	
6	2/19/2019	Chapter 5 Sections 5.1, 5.2, 5.4, 5.6, 5.7	Assignment 2
7	2/26/2019	Chapter 6 Sections 6.1, 6.2	
8	3/5/2019	Chapter 7 Sections 7.1-7.50, 7.7, 7.8.1, 7.8.2, 7.9	
9	3/12/2019	Spring Break	
10	3/19/2019	Midterm	
11	3/26/2019	Chapter 8 Sections 8.1.1, 8.5.1, 8.5.2	Assignment 3
12	4/2/2019	Chapter 9 Sections 9.1-9.4	
13	4/9/2019	Chapter 10 Sections 10.1-10.3.2	
14	4/16/2019	Selected topics	
15	4/23/2019	Selected topics	Assignment 4
16	4/30/2019	Final Exam	
17	5/7/2019	Selected topics	

Important University Dates:

2-Jan-19	Priority Deadline for Spring Admissions applications
10-Jan-19	Convocation
11-Jan-19	Deadline for Tuition and Fee Payments (16- & First 8-Week Classes)
14-Jan-19	Add, Drop, and Late Registration Begins for 16- and First 8-Week. \$25 fee assessed for late registrants.
14-Jan-19	Classes Begin for Spring Semester
16-Jan-19	Deadline for Add, Drop, and Late Registration for 16- and First 8-Week Classes
21-Jan-19	Martin L. King Jr. Day (University Closed)
22-Jan-19	Deadline to Drop First 8-Week Classes with No Record
30-Jan-19	Deadline to Drop 16-Week Classes with No Record
22-Feb-19	Student End of Course Survey Opens (First 8-Week Classes)
22-Feb-19	Deadline to Drop First 8-Week Classes with a Quit (Q) or Withdraw (W)
1-Mar-19	Deadline for Graduation Application for Spring Ceremony Participation
1-Mar-19	Deadline for Teacher Education and Professional Certification Applications (i.e. Principal, Reading Specialist, etc.)
8-Mar-19	Classes End for First 8-Week Session
8-Mar-19	Deadline for Spring Admissions Applications
10-Mar-19	Student End of Course Survey Closes (First 8-Week Classes)
11-Mar-19	Spring Break – No Class (University Open)
11-Mar-19	Deadline for Faculty Submission of First 8-Week Final Class Grades (due by 3pm)
13-Mar-19	Spring Break – No Class (University Open)
14-Mar-19	Spring Break – No Class (University Open)
15-Mar-19	Deadline for Tuition and Fee Payments (Second 8-Week Classes)
15-Mar-19	Deadline for Clinical Teaching Applications
15-Mar-19	Spring Break – No Class (University Open)
18-Mar-19	Add, Drop, and Late Registration Begins for Second 8-Week Classes. \$25 fee assessed for late registrants.
18-Mar-19	Classes Begin for Second 8-Week Session
20-Mar-19	Deadline for Add, Drop, and Late Registration for Second 8-Week Classes
25-Mar-19	Deadline to Drop Second 8-Week Classes with No Record
1-Apr-19	Deadline for GRE/GMAT Scores to Office of Graduate Studies
5-Apr-19	Deadline to Drop 16-Week Classes with a Quit (Q) or Withdraw (W)
12-Apr-19	Deadline for Final Committee-Edited Theses with Committee Approval Signatures to Office of Graduate Studies for Spring
26-Apr-19	Student End of Course Survey Opens (16- and Second 8-Week Classes)
26-Apr-19	Deadline to Drop Second 8-Week Classes with a Quit (Q) or Withdraw (W)
10-May-19	Deadline for Applications for \$1,000 Tuition Rebate for Spring Graduation (5pm)
10-May-19	Deadline for Degree Conferral Applications to the Registrar's Office. \$20 Late Application Fee.
10-May-19	Deadline to Withdraw from the University for 16- and Second 8-Week Classes
10-May-19	Spring Semester Ends

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/>] 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

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://tamuct.campuslabs.com/engage/organization/tamuct-student-conduct-panel), [https://tamuct.campuslabs.com/engage/organization/tamuct-student-conduct-panel]. 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].

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](https://www.tamuct.edu/student-affairs/access-inclusion.html) web page [https://www.tamuct.edu/student-affairs/access-inclusion.html].

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 the [Student Affairs](https://www.tamuct.edu/student-affairs/index.html) web page [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](http://www2.ed.gov/about/offices/list/ocr/docs/pregnancy.pdf), 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.

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.

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 FREE online tutoring and writing support. 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-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 [WCOOnline](#). In addition, you can email Dr. Bruce Bowles Jr. at 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].

INSTRUCTOR POLICIES

Students should come to class prepared, ready to ask questions and participate in discussions.

While in other classes, the direct quoting of other authors is considered acceptable; in this class,

it is not acceptable. You may not directly quote any other published paper, web site, or textbook in any writing assignment, including papers, homework, discussion boards, PowerPoint presentations, or any other written assignments. The simple reason for this is that copying (quoting) is a lower level skill. However, reading, understanding, and then communicating the ideas in your own words is a high level skill that I want you to develop.

Please note that plagiarism, is a serious problem, and that any plagiarized assignment will result in a failing grade for this class.

Do not submit any code that is not yours. Do not copy code from websites, other students, tutors, friends, family, or from any other source that is not your brain. If you get help with any code, you must make it clear which portions of the code you had help with and which you wrote. You must supply the contact information for the person, web site, youtube video, or other person who helped you. This is very important because you will only learn to write code by writing code. Yes, some concepts are difficult, but if you do not write the code and solve the problems, you will not learn how to write code and solve problems. Having someone explain a solution or algorithm to you or help you debug a problem is acceptable and allowed. Having someone else write the code for you is not OK. Submitting someone else's code as your own will result in a failing grade for this class.

Unless you make prior arrangements, all late assignments will lose 30% of their point value every day they are late. Late assignments will be graded at the professor's discretion. Once graded, I will not grade an assignment again.

All projects must have the author's name in every class and method submitted. (See Code Documentation Standards and Report Format Specification.) Every project submitted must be named starting with the student's last name followed by the project number. All projects must be zipped using WinZip. The zipped file submitted must be named, starting with the student's last name. Projects that do not follow this naming and documentation standard will be returned ungraded.

Instructor Information

Dr. Woodcock has a PhD in Computer Science from Florida Atlantic University. He has over 25 years of real world experience working for IBM and Sony-Ericsson. Dr. Woodcock believes that you will learn best by being engaged in class, asking questions, participating in discussion, and doing the hands on exercises.

This class will be a lot of work, but it will also be fun.

Dr. Woodcock reserves the right to modify this syllabus during the semester.

Copyright Notice.

Students should assume that all course material is copyrighted by the respective author(s). Reproduction of course material is prohibited without consent by the author and/or course instructor. Violation of copyright is against the law and Texas A&M University-Central Texas' Code of Academic Honesty. All alleged violations will be reported to the Office of Student Conduct.

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