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COSC 2336 Data Structures and Algorithms

Fall 2025

INSTRUCTOR INFORMATION

Instructor: Kathiravan Natarajan
Office Location: Online
Office Hours: Zoom, Friday 9 AM to 3 PM
Office Phone: N/A
Office Fax: N/A
University Email Address: Kathiravan.Natarajan@tamuc.edu
Preferred Form of Communication**:** Email with the course name as prefix
Communication Response Time: Email (1 day to 3 days)

COURSE INFORMATION

Materials – Textbooks, Readings, Supplementary Readings

Textbook(s) Required
Data Structures and Algorithms in Python, 1st Edition
Author: Michael T. Goodrich, Roberto Tamassia, Michael H. Goldwasser
Edition: 1ST
Published Date: 2013
ISBN: 978-1-118-47673-4
Publisher: WILEY

Course contents will be shared on the course web page. A textbook is beneficial but not mandatory.

Software Required

It will be communicated on the course web page.

Optional Texts or Materials

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Course materials should suffice in achieving the educational goals of this course.

Course Description

This course provides a deep dive into the fundamental principles of algorithms and data structures that are critical to modern computer science. Using *Introduction to Algorithms and Data Structures* by Cengage (1st Edition, 2024), students will explore recursive thinking, algorithm design, and key data structures such as lists, stacks, queues, hash tables, trees, and graphs. The course emphasizes writing efficient, maintainable code and developing the problem-solving mindset needed for technical interviews and real-world software development. By the end of the course, students will be able to design, implement, and analyze algorithms for a variety of computational problems.

Student Learning Outcomes

1. Understand and apply recursion in algorithmic problem solving.
2. Identify and implement fundamental data structures, including arrays, linked lists, stacks, queues, hash tables, trees, and graphs.
3. Analyze the efficiency of algorithms using time and space complexity (Big O notation).
4. Design and compare sorting and searching algorithms for optimal performance.
5. Apply graph algorithms and tree structures to model real-world problems.
6. Use abstract data types to solve complex computational tasks effectively.
7. Develop and evaluate advanced algorithms for specialized tasks, improving both speed and scalability.

Minimal Technical Skills Needed

No prerequisites needed

Instructional Methods

The instructor will share the course materials on the course web page in documents; the instructor will explain some complex concepts via video recordings or through zoom meetings based on students' requests.

Student Responsibilities or Tips for Success in the Course

Build a weekly habit of completing the lessons from the course materials on time every week. Practicing "practice quizzes" would help to score better in the weekly graded quizzes and the mid-term and final exams. Foundational knowledge is essential. If any questions or problems in understanding, never wait for the next week as the instructor would explain some concepts based on the previous weeks. If the materials are hard to understand for some students, the instructor will create study groups to revise the concepts. Work proactively on the instructor's research direction to score the maximum

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grade in the team research project. The instructor will be able to help with the programming problems and research questions for the students.
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GRADING

Final grades in this course will be based on the following scale:

A = 90%-100%
B = 80%-89%
C = 70%-79%
D = 60%-69%
F = 59% or Below

Weights of the assessments in the calculation of the final letter grade:

Weekly Quizzes	20%
Assignment	25%
Two Midterm Exams	30%
Final Exam	15%
TOTAL	100%

Assessments

Assessments will be conducted online, including the two midterm exams, the final exam, and the team research project. A case study will include a team of 5 students. The instructor will provide weekly directions on the case study. The students should submit a complete report on the case study or publish the research report in a journal or conference at the end of the semester to achieve the assigned score. The instructor will equip the students in all possible ways to score the most in the case study.

TECHNOLOGY REQUIREMENTS

LMS

All course sections offered by Texas A&M University-Commerce have a corresponding course shell in the myLeo Online Learning Management System (LMS). Below are the technical requirements

LMS Requirements:
https://community.brightspace.com/s/article/Brightspace-Platform-Requirements

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LMS Browser Support:
https://documentation.brightspace.com/EN/brightspace/requirements/all/browser_support.htm

YouSeeU Virtual Classroom Requirements:
https://support.youseeu.com/hc/en-us/articles/115007031107-Basic-System-Requirements

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all coursework in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's house, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

If you have any questions or are having difficulties with the course material, please get in touch with your instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, don't hesitate to get in touch with Brightspace Technical Support at 1-877-325-7778. Other support options can be found here:

https://community.brightspace.com/support/s/contactsupport

Interaction with Instructor Statement

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COURSE AND UNIVERSITY PROCEDURES/POLICIES

Course Specific Procedures/Policies

MAKEUP POLICY

There will be NO makeup exams/assignments in general. However, with prior notification and valid documents, makeup chances may be given to students under extreme circumstances, such as hospitalization, serious injury, death in the family, etc. No makeup allowed for other than exams and assignments.

COLLABORATION POLICY

Students are encouraged to discuss any of the assignments with each other, to the instructor, or to anyone else. However, any assistance must be limited to discussion of the problem and sketching general approaches to a solution. Each student must write out his or her solutions to the homework. Consulting another student's or group's solution is allowed for team research project but prohibited for exams and quizzes. These and any other form of collaboration on assignments constitute cheating. If you have any question about whether some activity would constitute cheating, please feel free to ask.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may require the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum:
https://www.britannica.com/topic/netiquette

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TAMUC Attendance

For more information about the attendance policy, please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholarly work. For more details and the definition of academic dishonesty, see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03
Undergraduate Student Academic Dishonesty Form

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/documents/13.99.99.R0.03UndergraduateStudentAcademicDishonestyForm.pdf

Graduate Student Academic Dishonesty Form

http://www.tamuc.edu/academics/graduateschool/faculty/GraduateStudentAcademicDishonestyFormold.pdf

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Students with Disabilities-- ADA Statement

The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Velma K. Waters Library Rm 162
Phone (903) 886-5150 or (903) 886-5835
Fax (903) 468-8148
Email: studentdisabilityservices@tamuc.edu
Website: Office of Student Disability Resources and Services

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http://www.tamuc.edu/campusLife/campusServices/studentDisabilityResourcesAndServices/

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information, or veteran status. Further, an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry Statement

Texas Senate Bill - 11 (Government Code 411.2031 et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations.

For a list of locations, please refer to the Carrying Concealed Handguns On Campus document and/or consult your event organizer.

Web URL:
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf

Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses—report violations to the University Police Department at 903-886-5868 or 9-1-1.

A&M-Commerce Supports Students' Mental Health

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Department or Accrediting Agency Required Content

COURSE OUTLINE / CALENDAR (Tentative)

Week	Start Date	Content / Activity	Text Reference	Quiz / Homework
W1	8/27/2025	Course Introduction & Recursion	Chapter 1	HW 1 Assigned
W2	9/3/2025	Introduction to Data Structures	Chapter 2	
W3	9/10/2025	Designing Efficient Algorithms	Chapter 3	Quiz 1
W4	9/17/2025	Sorting Algorithms I (Selection, Insertion)	Chapter 4 (part 1)	HW 2 Assigned
W5	9/24/2025	Sorting Algorithms II (Merge, Quick Sort)	Chapter 4 (part 2)	Quiz 2, HW 3
W6	10/1/2025	Midterm 1 – No instruction this week	Covers Ch.1–4	
W7	10/8/2025	Search Algorithms (Linear, Binary, etc.)	Chapter 5	Quiz 3, HW 4
W8	10/15/2025	Linked Lists, Stacks, and Queues	Chapter 6	
W9	10/22/2025	Hash Tables	Chapter 7	Quiz 4
W10	10/29/2025	Trees (Binary Trees, Heaps, AVL Trees)	Chapter 8	Quiz 5, HW 5
W11	11/5/2025	Midterm 2 – No instruction this week	Covers Ch.5–8	
W12	11/12/2025	Graphs I (BFS, DFS, Representation)	Chapter 9 (part 1)	HW 6 Assigned
W13	11/19/2025	Graphs II (Shortest paths, MST, Topo Sort)	Chapter 9 (part 2)	Quiz 6
W14	11/26/2025	Advanced Algorithms (Greedy, DP, B-Trees)	Chapter 10	
W15	12/3/2025	Final Exam Week	Covers Entire Course	

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