CS5633: Design and Analysis of Algorithms

Spring 2025

(The official syllabus is the current version on Canvas)

Course Description and Objectives:	The purpose is to learn to be able to design various classes of algorithms and analyze them. Design Techniques: Divide-and-Conquer, Greedy, Dynamic Programming, Parallel. Topics: Analyzing algorithms and problems; Growth rates; Searching; Sorting; Selection; Lower Bounds; Graph Algorithms: minimum spanning tree and shortest path; Introduction to NP-complete Problems; Coloring, Clique, Satisfiability; Cook's Theorem, Approximation Algorithms. Some material will be covered by reading assignments. The overall goals are as follows: - A general understanding of techniques for designing and analyzing algorithms - Ability to understand common problems and employ suitable techniques to design an efficient algorithm and analyze it - Ability to implement algorithms and study their performances
Instructor:	Sushil K. Prasad, sushil.prasad@utsa.edu E-mail is the best way to reach me!! Put "CS5633:...." in the subject line
Time/ Coordinates	MW 4:30-5:45pm Room San Pedro I (SP1) - Data Science 200
Office:	NPB 3.344; SP1: M/W: 310G
Online Materials:	Will generally be posted/referred to on Canvas under "Contents" section.
Office Hours:	MW – 11am-12pm @ SP1-310G; These may be cancelled occasionally due to academic meetings.
Grader/TA:	Lezil, Aveline (aveline.lezil@utsa.edu) + Mahmud, Hasanul (hasanul.mahmud@utsa.edu)
TA Office Hrs:	TBD
Prerequisites:	CS 2124 - Data Structures, CS 2233 - Discrete Math, and CS 3333 - Mathematical Foundations of Computer Science or equivalent with a C- or better; CS 3343
Texts References:	"Introduction to Algorithms," Cormen, Leiserson, Rivest, and Stein, 4th edition, 2022, MIT Press. Additional material will be employed.
Attendance:	You may be dropped if you have more than two unauthorized absences. Students are responsible for all the material covered or assigned (whether or not in the text). No classes March 10-15 (Spring Break) Last class is on May 7 (Wed). Drop Deadline to receive a W: March 31
Computer Accounts:	You will have an account on the CS network as long as you are enrolled in a CS course at UTSA. This account gives you access to Windows and Linux in various CS laboratories. You may also access your account from off-campus via the Internet using secure shell. CS department resources: https://sciences.utsa.edu/computer-science/resources.html

Grading:

	Weight	Date
Attendance and Class Participation	5%	
Assignments	30%	
Test 1	15%	Feb 26
Test 2	20%	April 9
Test 3	20%	May 12, Mon 3:00 - 4:50 PM
Term Project	10%	Due May 5

Weights are assigned for assignments according to the level of difficulty and the number of assignments. Final grades will be relative to the class performance. To ensure a specific grade, general guideline is grade A >= 90%, B>= 80%, C>=70% and D>=60%, and +/- will be employed.

Course Rules:	You are fully responsible for all material presented in class or assigned. Exams and due dates are scheduled in advance. A grade of zero will be recorded for missed exams and late assignments unless prior arrangements are made or for university excused absences (e.g., military service, medical emergency, etc.). Programming assignments turned in after the due date (with prior arrangements), but within a week from the due date are penalized 10%. Assignments that are more than one week late will earn 0%. *All assignments and projects must be completed to pass the course.*
Cheating:	Students are encouraged to discuss in general and ask clarifying questions, but not offer solutions - using another's/third-party solutions or writing solutions for someone else is cheating and a violation of the University's Honor Code. This includes consulting solutions to assignments/test from previous offerings. Use of LLMs should be well documented (how, pros, cons), if and when allowed.
University Policies**:**	For common UTSA syllabus information that is part of every syllabus, see the page Common Syllabus Information | UTSA | The University of Texas at San Antonio. It includes the links and the mandatory administrative information concerning disability services, the academic dishonesty policy, and other important issues.
Additional Academic Support:	I encourage you to utilize the academic support services available to you through the Tomás Rivera Center (TRC) to assist you with building study skills, etc. These services are available at no additional cost to you. The TRC has several locations at the Main Campus and is also located at the Downtown Campus. For more information, visit the web site at www.utsa.edu/trcss or call (210) 458-4694 on the Main Campus and (210) 458-2838 on the Downtown Campus.
Exclusion Zone:	Pursuant to HOP 9.48, Carrying of Concealed Handguns on Campus, my offices (NPB 3.344; SP1: 260D; 470F) are designated exclusion zone. As set out in Section 30.06, Penal Code (trespass by license holder with a concealed handgun), a person licensed to carry a Concealed Handgun under Subchapter H, Chapter 411 Government Code (handgun licensing law), may not enter this property/office with a concealed handgun. De conformidad con HOP 9.48, Llevar Armas de Fuego Encubiertas en el Campus, mi oficina privada (NPB 3.344; SP1: 260D; 470F) es una zona designada de exclusión. Conforme a la sección 30.06 del código penal (trespasar portando armas de fuego) personas con licencia bajo del sub-capitulo H, capitulo 411, codigo de gobierno (ley de portar armas), no deben entrar a esta propiedad portando un arma de fuego.
Disclaimer:	The syllabus is subject to change at the instructor's discretion. Any changes/corrections to the course materials, assignment dates, or other updates will be communicated to the students ahead of time. You are responsible for checking Canvas for corrections or updates to the syllabus. (Jan 21, 2025)