

Computer Science 3364
Design and Analysis of Algorithms
Course Syllabus and Policy Statement
Fall 2017

Instructor: Dr. Michael Gelfond

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Office hours: 2:10—4:10 Tu or by appointment

TA: To be announced (if any)

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Catalogue Listing: A theoretical course focusing on the design and analysis of computer algorithms.

Texts: “Algorithm Design”, by Kleinberg and Eva Tardos.

Course objectives:

1. Reinforce basic design concepts (e.g., pseudocode, specifications, top-down design)
2. Knowledge of algorithm design strategies
3. Familiarity with an assortment of important algorithms
4. Ability to analyze time and space complexity

Key Topics:

Algorithm design strategies such as divide and conquer, dynamic programming, greedy algorithms, backtracking and branch-bound. Computational complexity of sorting and searching algorithm. Introduction to Theory of NP problems. Recurrence equations. Asymptotic notations for complexity classes.

Course Prerequisites: CS 2413, CS 1382, MATH 2360

Expected Prior Knowledge and Skills: Proficiency in a programming language, basic program design concepts (e.g., pseudocode), combinatorics and probability, proof techniques, familiarity with tree and graph data structures, familiarity with basic algorithms such as those for searching, and sorting.

Learning Outcomes: Students who have completed this course should be able to

1. Apply design principles and concepts to algorithm design (c)
2. Have the mathematical foundation in analysis of algorithms (a, j)
3. Understand different algorithmic design strategies (j)
4. Analyze the efficiency of algorithms using time and space complexity theory (b)

Assessment methods of all of the above: quizzes, exams, assignments

Homework Policy: Homework problems will be given frequently. Homework will be graded solely on whether it attempted (check) or not (zero). Students should view homework as a means of identifying weaknesses in their understanding of a subject. This will hopefully lead to questions in class. Quizzes are possible at the instructor’s discretion. No late homework will be accepted.

Test Policy: All tests will count towards the final grade; i.e. no exam grades will be "dropped". Only students that miss an exam due to a university-approved absence are eligible to take the makeup exam.

After the exams are returned to the class, if there are any questions concerning the grading of the exam, the student should ask for clarification as soon as possible.

Cheating Policy:

Cheating on tests will not be tolerated. Any student caught cheating on an exam will receive a grade of 'F' for the course, will be recommended for suspension from the program, and will be reported to the Judicial Programs office for possible further sanctions from the University.

Course Grading: The course will be graded according to the following scale.

Course Average Determination:

200	Tests 1 & 2
150	Final
50	Quizzes/Homework

Course Grade Division:

90 – 100	A
80 – 89	B
70 – 79	C
60 – 69	D
0 – 59	F

There will be no extra-credit or curving of grades in the class.

Course Schedule (tentative, tests will be announced):

Date	Subject
8/28	Introduction
8/30	Stable Matching
9/1	Stable Matching
9/4	Stable Matching
9/6	Basics of Algorithm Analysis
9/8	Priority Queue
9/11	Graphs
9/13	Graphs
9/15	Graphs
9/18	Greedy Algorithms
9/20	Greedy Algorithms
9/22	Greedy Algorithms
9/25	Greedy Algorithms
9/27	Greedy Algorithms
9/29	Divide and Conquer
10/2	Divide and Conquer
10/4	Review
10/6	TEST 1
10/9	Discussion
10/11	Divide and Conquer
10/13	Divide and Conquer
10/16	Divide and Conquer
10/18	Divide and Conquer
10/20	Dynamic Programming
10/23	Dynamic Programming
10/25	Dynamic Programming
10/27	Dynamic Programming
10/30	Dynamic Programming
11/1	Dynamic Programming
11/3	Intractable Problems
11/6	Intractable Problems
11/8	Intractable Problems
11/10	Review
11/13	Review
11/15	Test 2
11/17	Discussion

11/20	Review
11/27	
11/29	
12/1	
12/4	
12/6	
12/8	Final Exam 7:30 pm - 10:00 pm

Academic Conduct: Policy of the Department and the University will be followed. All work done in this course should conform to the *Statement of Academic Conduct for Engineering Students, College of Engineering, Texas Tech University*.

Attendance Policy:

- You are expected to be present for each class session.
- If you are absent, it is your responsibility to obtain class notes and handouts (if any) from your classmates; I will not necessarily keep extra copies of materials after they are initially distributed;
- There are no makeup exams or tests for unexcused absences.
- Absence due to religious observance -The Texas Tech University Catalog states that a student who is absent from classes for the observance of a religious holy day will be allowed to take an examination or complete an assignment scheduled for that day within a reasonable time after the absence (p.49). Notification must be made in writing and delivered in person no later than the 15th class day of the semester.
- Whether an absence is excused or unexcused is determined solely by the instructor with the exception of absences due to religious observance and officially approved trips. The Center for Campus Life will notify faculty, at the student’s request, when a student is absent for four consecutive days with appropriate verification of a health related emergency. This notification does not excuse the student from class, it is provided as a courtesy. The service is explained as follows and can be found on the Center for Campus Life web site at:
<http://www.campuslife.ttu.edu/crisis/>

Illness and Death Notification: The Center for Campus Life is responsible for notifying the campus community of student illnesses, immediate family deaths and/or student death. Generally, in cases of student illness or immediate family deaths, the notification to the appropriate campus community members occur when a student is absent from class for four (4) consecutive days with appropriate verification. It is always the student’s responsibility for missed class assignments and/or course work during their absence. The student is encouraged to contact the faculty member immediately regarding the absences and to provide verification afterwards. The notification from the Center for Campus Life does not excuse a student from class, assignments, and/or any other course requirements. The notification is provided as a courtesy.

Academic Integrity:

“It is the aim of the faculty of Texas Tech University to foster a spirit of complete honesty and a high standard of integrity. The attempt of students to present as their own any work that they have not honestly performed is regarded by the faculty and administration as a serious offense and renders the offenders liable to serious consequences, possibly suspension.”

“Scholastic dishonesty” includes, but is not limited to, cheating, plagiarism, collusion, falsifying academic records, misrepresenting facts, and any act designed to give unfair academic advantage to the student (such as, but not limited to, submission of essentially the same written assignment for two courses without the prior permission of the instructor) or the attempt to commit such an act.

“Cheating” includes, but is not limited to, the following:

1. Copying from another student’s test paper.
2. Using materials during a test that have not been authorized by the person giving the test.
3. Failing to comply with instructions given by the person administering the test.
4. Possessing materials during a test that are not authorized by the person giving the test, such as class notes or specifically designed “crib notes.” The presence of textbooks constitutes a violation only if they have been specifically prohibited by the person administering the test.

5. Using, buying, stealing, transporting, or soliciting in whole or part the contents of an unadministered test, test key, homework solution, or computer program.
6. Collaborating with or seeking aid or receiving assistance from another student or individual during a test or in conjunction with an assignment without authority.
7. Discussing the contents of an examination with another student who will take the examination.
8. Divulging the contents of an examination, for the purpose of preserving questions for use by another, when the instructor has designated that the examination is not to be removed from the examination room or not to be returned to or kept by the student.
9. Substituting for another person, or permitting another person to substitute for oneself to take a course, a test, or any course related assignment.
10. Paying or offering money or other valuable thing to, or coercing another person to obtain an un-administered test, test key, homework solution, or computer program, or information about an un-administered test, test key, homework solution, or computer program.
11. Falsifying research data, laboratory reports, and/or other academic work offered for credit.
12. Taking, keeping, misplacing, or damaging the property of the university, or of another, if the student knows or reasonably should know that an unfair academic advantage would be gained by such conduct.

“Plagiarism” includes, but is not limited to, the appropriation of, buying, receiving as a gift, or obtaining by any means material that is attributable in whole or in part to another source, including words, ideas, illustrations, structure, computer code, other expression and media, and presenting that material as one’s own academic work being offered for credit. Any student who fails to give credit for quotations or for an essentially identical expression of material taken from books, encyclopedias, magazines, Internet documents, reference works or from the themes, reports, or other writings of a fellow student is guilty of plagiarism.

“Collusion” includes, but is not limited to, the unauthorized collaboration with another person in preparing academic assignments offered for credit or collaboration with another person to commit a violation of any section of the rules on scholastic dishonesty.

Civility in the Classroom:

Students are expected to assist in maintaining a classroom environment that is conducive to learning. To ensure that all students have the opportunity to gain from time spent in class, faculty members are encouraged to include a statement in their course syllabi relating to behavioral expectations in the classroom.

Students with Disabilities

ADA Statement:

Any student who, because of a disability, may require special arrangements in order to meet the course requirements should contact the instructor as soon as possible to make any necessary arrangements. Students should present appropriate verification from Student Disability Services during the instructor’s office hours. Please note instructors are not allowed to provide classroom accommodations to a student until appropriate verification from Student Disability Services has been provided. For additional information you may contact the Student Disability Services office in 335 West Hall or 806-742-2405.