Course title and number: CSCE 411 Design and Analysis of Algorithms
Term: Spring 2014
Meeting times and location: MWF 11:30-12:20 HRBB 126

Course Description and Prerequisites

The course focuses on the study of computer algorithms, in particular design paradigms of algorithms, the analysis of time and space requirements of algorithms, and the correctness of algorithms. Furthermore, the course studies NP-completeness and undecidability.

Prerequisites: CSCE 221, CSCE 222 and CSCE 315

Learning Outcomes or Course Objectives

At the end of the semester, you should:
- be familiar with fundamental algorithms and algorithmic techniques;
- given a particular application, be able to decide which algorithm among a set of choices is best;
- be able to prove correctness and analyze running time and space complexity of a given algorithm;
- be able to design efficient algorithms for new situations using the techniques learned;
- be able to prove that a problem is NP-complete using reduction and understand the implications;
- understand the notion of undecidability, know that some problems are undecidable, and comprehend the implications.

Instructor Information

Name	Prof. Dr. Andreas Klappenecker
Telephone number	979 458 0608
Email address	klappi@cse.tamu.edu
Office hours	MT 1:30-2:30pm or by appointment
Office location	HRBB 509B

Textbook and/or Resource Material

Cormen, Leiserson, Rivest, Stein: Introduction to Algorithms, 3rd edition, The MIT Press, 2009.

Grading Policies

Your grade will be based on these components:
- Quizzes: 10% (your lowest quiz grade will be dropped)
- Homeworks: 35% (written problems and programming assignments, your lowest homework score will be dropped)
- Exams: 45% (one midterm worth 20% and one final exam worth 25%)
- Participation and attendance: 10%

The course grades will be assigned according to the scale:
A (90-100 % of total points), B (80-89%), C (70-79%), D (60-69%), F (0-59%)
A curve might be applied if the course average is below expectation.
Grades must be earned and are not negotiable.

Course Topics, Calendar of Activities, Major Assignment Dates

The midterm is exam is tentatively scheduled for Monday, February 21, in class.
The final exam is scheduled for Wednesday, May 7, 10:30am-12:30pm, in our classroom.

A tentative schedule is given below:

Dates	Topic	Required Reading
M Jan 13	Introduction	
W Jan 15	Introduction	
F Jan 17	Asymptotic Notations	
M Jan 20	No class MLK, Jr. day	
W Jan 22	Sorting Lower Bound	
F Jan 24	Sorting Lower Bound	
M Jan 27	Divide and Conquer Algorithms	
W Jan 29	Divide and Conquer Algorithms	
F Jan 31	Divide and Conquer Algorithms	
M Feb 3	Greedy Algorithms	
W Feb 5	Greedy Algorithms	
F Feb 7	Matroids	
M Feb 10	Matroids	
W Feb 12	Matroids	
F Feb 14	Dynamic Programming	
M Feb 17	Dynamic Programming	
W Feb 19	Dynamic Programming	
F Feb 21	Review	
M Feb 24	Midterm exam	
W Feb 26	Amortized Analysis	
F Feb 28	Amortized Analysis	
M Mar 3	Graph Algorithms	
W Mar 5	Graph Algorithms	
F Mar 7	Graph Algorithms	
M Mar 10	No class, Spring break.	
W Mar 12	No class, Spring break.	
F Mar 14	No class, Spring break.	
M Mar 17	Graph Algorithms	
W Mar 19	Graph Algorithms	
F Mar 21	Randomized Algorithms	
M Mar 24	Randomized Algorithms	
W Mar 26	Randomized Algorithms	
F Mar 28	Randomized Algorithms	
M Mar 31	Randomized Algorithms	
W Apr 2	Randomized Algorithms	
F Apr 4	NP-Completeness	
M Apr 7	NP-Completeness	

W Apr 9	NP-Completeness
F Apr 11	NP-Completeness
M Apr 14	NP-Completeness
W Apr 16	NP-Completeness
F Apr 18	Approximation Algorithms
M Apr 21	Approximation Algorithms
W Apr 23	Undecidability
F Apr 25	Undecidability
M Apr 28	Review
T Apr 29	Review

Other Pertinent Course Information

The course webpage can be found at
http://faculty.cs.tamu.edu/klappi/csce411-s14/index.html
You will find homework assignments, a current class schedule, and other information on that page.

Many parts of this class are taught "flipped", meaning that you need to watch the screencast with a lecture or read a chapter in the book to prepare for class. Make sure that you prepare very thoroughly, as this is important for the success in this course. In class, we will often work through some problems, so that you learn how to apply the methods that you have learned.

Americans with Disabilities Act (ADA)

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 believe you have a disability requiring an accommodation, please contact Disability Services, in Cain Hall, Room B118, or call 845-1637. For additional information visit http://disability.tamu.edu

Deadline Policy

Turn in all work by the established deadline. In case you have difficulties finishing an assignment contact the Instructor before the deadline. Late work can be accepted only under circumstances beyond the student's control and after arrangement with the Instructor prior to the deadline. **Note**: work turned-in on time is eligible for partial credit. It will always be better to turn work in by the deadline, as trying to 'perfect' it and turning it in late will give you no points at all.

Submission of Work and Late Submission Policy

All assignments must be submitted electronically using the **CSNET** portal **by the due date and time** and an honor-code signed hardcopy must be turned in in the beginning of class of the due date. Late submission beyond the cutoff will not be accepted in general, unless a University sanctioned excuse is provided ahead of time. A student will earn points when he/she submits the assignment on time. Note that email submissions will not be accepted (they will be ignored without notice). You have to follow the submission and media policies and guidelines published on the web. One homework will be dropped.

Regrading Policy

If you believe that an assignment or exam was not correctly graded, then submit within one week a written request to regrade the assignment or exam. A regrading requests must be as specific as possible and must be accompanied by a reasonable amount of justification and documentation. In addition to the work to be regraded and the written regrading request, you need to send an e-mail to both the TA and the instructor so that your request can be tracked. Late regrading requests will not be honored.

Excused Absences and Make-up Policy

Make-ups for assignments and exams will be given only under circumstances beyond student's control (*a university sanctioned excuse*). Prior arrangements with the instructor must be made when feasible and official verification of circumstances necessitating the absence will be required.

Copyright

The handouts and screencasts used in this course are copyrighted. By "handouts" we mean all materials generated for this class, which include but are not limited to syllabi, lab problems, in-class materials, review sheets, and additional problem sets. Because these materials and screencasts are copyrighted, you do not have the right to copy or repost them, unless the author expressly grants permission.

Scholastic Dishonesty

As commonly defined, plagiarism consists of passing off as one's own the ideas, work, writings, etc., that belong to another. In accordance with this definition, you are committing plagiarism if you copy the work of another person and turn it in as your own, even if you have the permission of the person. Plagiarism is one of the worst academic sins, for the plagiarist destroys the trust among colleagues without which research cannot be safely communicated. If you have questions regarding plagiarism, please consult the latest issue of the Texas A&M University Student Rules [http://student-rules.tamu.edu/rule52], under the section "Academic Misconduct".

Academic Integrity Statement
"An Aggie does not lie, cheat, or steal or tolerate those who do."

Upon accepting admission to Texas A&M University, a student immediately assumes a commitment to uphold the Honor Code, to accept responsibility for learning and to follow the philosophy and rules of the Honor System. Students will be required to state their commitment on examinations, research papers, and other academic work. Ignorance of the rules does not exclude any member of the Texas A&M University community from the requirements or the processes of the Honor System. For additional information please visit: http://aggiehonor.tamu.edu

On all assignments and examinations at Texas A&M University, the following Honor Pledge shall be preprinted and signed by the student: "**On my honor, as an Aggie, I have neither given nor received unauthorized aid on this academic work.**"

Violations of the Aggie honor code will be reported to the Aggie honors office. The default sanction for a first offence is an F*.