CS 411 - F01
Analysis of Algorithms
Fall 2018

Instructor: Dr. Chris Hartman
Email: cmhartman@alaska.edu
Office: 525 Duckering
Office Hours: MWF 10:30-12:30 or by appointment
Convenient appointment times are MWF 3:30 and Tuesday at noon, but you are welcome to stop by any time my door is open or email me to set up another time.

Prerequisites: CS 311 and MATH 307.

Text: Intro to Design & Analysis of Algorithms (3rd ed.) Levitin

Website: Course BlackBoard site at http://classes.alaska.edu

Schedule: MWF 2:15 – 3:15 Duckering 341
(From Monday, Aug. 28th until Friday, December 8th)

Midterm Exam: Friday, October 19th.
Final Exam: 1:00pm to 3:00pm Wednesday, December 12th.

Assessment: The following items will be used in the following proportions to determine student grades.

Homework	50%
Quizzes	5%
Midterm Exam	20%
Final Exam	25%

Course topics and goals – CS 411 covers design techniques for efficient algorithms, along with standard algorithms that are based on these techniques.

We begin by discussing algorithms, efficiency, and the mathematical tools we use in analyzing these. We will spend most of the semester covering various algorithm-design ideas: brute force/exhaustive search, decrease-and-conquer, divide-and-conquer, transform-and-conquer, trading space for time, dynamic programming, greedy methods, iterative improvement. We will finish the semester with a discussion of the limits of algorithmic efficiency, and how we deal with such limits.

Material – After taking this class, students will:
- Be able to set up and solve recurrence relations of the kinds encountered in the analysis of algorithms.
- Be able to determine the efficiency class of an algorithm.
- Be able to choose and/or design the best algorithm for a given problem.
- Be familiar with classic algorithms from major problem domains: sorting, sets, graphs, etc.
- Understand how approximation algorithms work and when they are appropriate.
- Have a basic understanding of NP-completeness and its impact on algorithm design.

Examinations – Examinations will consist of short answer questions to demonstrate critical thinking skills as well as application of computer science concepts.

Homework – Assignments will be required generally on a biweekly basis and will consist of both programming and answering questions. Some assignments will be done individually; others may be done in groups. Homework turned in late will generally be penalized. In order to do the homework assignments, students must obtain access to a C++ compiler with support for the C++11 standard.

Quizzes – Short in-class quizzes will be given, unannounced. However, possible quiz topics will always be announced in advance. No make-up quizzes will be given.

Policies – Students are expected to be at every class meeting on time, and are responsible for all class content, whether present or not. If absence from class is necessary, in-class work (other than quizzes) and homework may be made up only if the instructor is notified as soon as possible; in particular, absences due to scheduled events must be arranged ahead of time.

Students who fail to attend the first class meeting after registering for the class, or who miss four consecutive class meetings, may be dropped/withdrawn without warning, unless prior arrangements are made with the instructor.

Academic dishonesty will not be tolerated, and will be dealt with according to UAF procedures. You may discuss homework and lab assignments with others, but everything you turn in **must** be your own work.

Students in this class pay the CS lab fee. Payment allows access to open computer labs on 5th floor Duckering.

Examinations **must** be taken at the scheduled time. In particular, there **will be no** early final exams.

UAF academic policies: http://catalog.uaf.edu/academics-regulations

CS Department policies: http://www.cs.uaf.edu/departmental-policies

Disabilities Services – The Office of Disability Services implements the Americans with Disabilities Act (ADA), and insures that UAF students have equal access to the campus and course materials. I will work with the Office of Disabilities Services to provide reasonable accommodation to students with disabilities.