CMPS 201
Analysis of Algorithms
Fall 2018

Description:
Rigorous analysis of the time and space requirements of important algorithms, including worst case, average case, and amortized analysis. Techniques include order-notation, recurrence relations, information-theoretic lower bounds, adversary arguments. Analysis of the key data structures: trees, hash tables, balanced tree schemes, priority queues, Fibonacci and binomial heaps. Algorithmic paradigms such as divide and conquer, dynamic programming, union-find with path compression, augmenting paths. Selected advanced algorithms. Introduction to NP-completeness. Enrollment restricted to graduate students; undergraduate students may enroll in this course if they have completed either course 102 or Computer Engineering 177 and have the consent of the instructor.

Time and Place: TTh 11:40am - 1:15pm   Merrill 102
Class Webpage: https://classes.soe.ucsc.edu/cmps201/Fall18/

Instructor: Patrick Tantalo   http://users.soe.ucsc.edu/~ptantalo/
Office: E2 255
Office Hours: Wednesday 9:30am - 1:30pm, or by appointment
Email: ptantalo@soe.ucsc.edu

Teaching Assistants:
Ryan Compton (rcompton@ucsc.edu)
Saeed Kargar (skargar@ucsc.edu)

Required Text:
Introduction to Algorithms (3rd edition) by Cormen, Leiserson, Rivest and Stein (CLRS). MIT Press 2009 (ISBN 9780262033848).

Recommended Texts:
Fundamentals of Algorithmics, Brassard and Bratley, Prentice Hall (1996).
Algorithmics: Theory and Practice, Brassard and Bratley, Prentice Hall (1988).
Computer Algorithms, Baase and van Gelder, 3rd ed, Addison-Wesley (2000).
Computer Algorithms: Introduction to Design and Analysis, Sara Baase, 2nd ed, Addison-Wesley (1988).
Algorithm Design Manual, Steven S. Skiena, Telos/Springer-Verlag (1997).
Computers and Intractability: A Guide to the Theory of NP-Completeness, M. Garey and D. Johnson, WH Freeman (1979).

Coursework:
- 10% Homework: Written exercises, mostly from CLRS.
- 20% Midterm Exam 1: Tuesday October 30, 11:40am-12:45pm (lecture to follow).
- 30% Midterm Exam 2: Tuesday November 20, 11:40am-12:45pm (lecture to follow).
- 40% Final Exam: Tuesday December 11, 8:00am-10:00am.

Grading scale:
A+	97.0% - 100%	
A	93.0% - 96.9%	
A-	90.0% - 92.9%	
B+	87.0% - 89.9%	
B	83.0% - 86.9%	

B-	80.0% - 82.9%
C+	76.0% - 79.9%
C	70.0% - 75.9%
C-	67.0% - 69.9%
D+	64.0% - 66.9%
D	61.0% - 63.9%
D-	58.0% - 60.9%
F	0% - 57.9%

Letter grade boundaries *may be* lowered at my discretion in order to eliminate some borderline cases.

Accommodations for Students with Disabilities

UC Santa Cruz is committed to creating an academic environment that supports its diverse student body. If you are a student with a disability who requires accommodations to achieve equal access in this course, please submit your Accommodation Authorization Letter from the Disability Resource Center (DRC) to me privately during my office hours or by appointment, preferably within the first two weeks of the quarter. At this time, I would also like us to discuss ways we can ensure your full participation in the course. I encourage all students who may benefit from learning more about DRC services to contact DRC by phone at 831-459-2089, or by email at drc@ucsc.edu.

Academic Honesty:

The Baskin School of Engineering has a zero tolerance policy for any incident of academic dishonesty. If cheating occurs, consequences may range from getting zero on a particular assignment to failing the course. In addition every case of academic dishonesty is referred to the students' college Provost, who sets in motion an official disciplinary process. Cheating in any part of the course may lead to failing the course, suspension or dismissal from the Baskin School of Engineering, or from UCSC.

What is cheating? In short, it is presenting someone else's work as your own. Examples would include copying written homework solutions from another student, or allowing your own work to be copied. Sharing any kind of information on an exam would also be considered cheating. You may discuss your homework solutions with fellow students, but your collaboration must be at the level of *ideas* only. You may freely give and receive help with any example discussed in class, in the text, or in one of the handouts. However, you may not share in the act of *writing* your solutions to homework problems. Please see the following links for the official UCSC policies on Academic Misconduct for

Graduate Students: https://www.ucsc.edu/academics/academic-integrity/
Undergraduate Students: https://www.ue.ucsc.edu/academic_misconduct