

COT 5405: ANALYSIS OF ALGORITHMS

SYLLABUS

"People who analyze algorithms have double happiness. First of all they experience the sheer beauty of elegant mathematical patterns that surround computational procedures. Then, they receive a practical payoff when their theories make it possible to get other jobs done more quickly and more economically..."

Donald E. Knuth

BASIC INFO

- **Semester:** Spring 2013
- **Schedule:** Tu 3-4, Th 4
- **Location:** NEB 0100
- **Professor:** Alper Üngör
E534 CSE Building
- **TAs:** Serdar Ayaz
Pegah Massoudi
(cot5405sp13@cise.ufl.edu)



World TSP

• Office hours:

	Mon	Tue	Wed	Thu	Fri
9:35		Lecture			
10:40		Lecture		Lecture	
11:45					
12:50				Alper	
13:55	Serdar	Pegah		Alper	
15:00	Serdar	Pegah			
16:05					

- **Web-page:** <http://www.cise.ufl.edu/class/cot5405sp13>
- **Prerequisites:** COP 3530 or equivalent, or Instructor's permission

MAIN THEME

The study of algorithms is aimed at creating techniques that will enable a computer to perform a certain task in an efficient manner. An *algorithm* is a set of well-defined instructions for accomplishing some task, often explained by analogy with a culinary recipe. To analyze an algorithm is to determine the amount of resources (such as time and storage) necessary to execute it. Usually the efficiency or complexity of an algorithm is stated as a function relating the input length to the number of steps (time complexity) or storage locations (space or memory complexity) required to execute the algorithm. In this course, we will study various algorithmic paradigms (such as divide-and-conquer, greedy, dynamic programming), various analysis techniques (such as worst-case, expected, approximate), various problem domains (such as searching, sorting, graph theory, geometric, and combinatorially hard) problems.

COURSEWORK

Grades will be based on homeworks (20%), two mid-term exams (each 25%), and a final exam (30%).

- **Homeworks:** There will be 5-6 assignments, each consisting of 4-6 problems. Half of each HW score will be based on the number of questions you attempted to solve, the other half will be based on a detailed evaluation of a single, randomly chosen question. **Late submissions will not be accepted.**
- **Exam:** The two mid-term exams will be in class. The final exam is comprehensive. All exams will be closed book.
- **Attendance:** This is an online class. Feel free to watch the lecture videos any time you like.

The grading scale will be $A = [100,90]$, $A^- = (90,87]$, $B^+ = (87,84]$, $B = (84,80]$, $B^- = (80,77]$, $C^+ = (77,74]$, $C = (74,70]$, $C^- = (70,67]$, $D^+ = (67,64]$, $D = (64,60]$, $D^- = (60,57]$, $E = (57,0]$ or more lenient if I decide to use a curve.

COURSE MATERIAL

- **Required Textbook:**

1. *Introduction to Algorithms (3rd ed)*., T.H. Cormen, C.E. Leiserson, R.L. Rivest, and C. Stein. (MIT Press and McGraw-Hill, 2009).

- **Recommended Textbooks:**

1. *Algorithm Design*. J. Kleinberg and E. Tardos. (Addison Wesley, 2005).
2. *Computers and Intractability*. M. R. Garey and D. S. Johnson, (Freeman, 1979).
3. *Computer Algorithms*. E. Horowitz, S. Sahni and S. Rajasekaran. (Computer Science Press, 1997).
4. I will also distribute other papers and sources.

- **Conferences:** STOC, FOCS, SODA, APPROX, RANDOM, SoCG, LATIN, ESA

- **Journals:** Journal of Algorithms, Algorithmica, Theoretical Computer Science, SIAM Journal on Computing, Journal of the ACM, International Journal of Computational Geometry and Applications, Computational Geometry : Theory and Applications

COURSE POLICIES

- *Regrading Policy:* You are free to ask me or one of the TAs why an answer did not get full credit. However, such verbal discussions will **never** result in extra points. Actual regrade requests must be made in writing, and then turned in to any of the TAs. Attach a separate page to your assignment/exam with the requested regrade and the reasons for the regrade. In no case may you write on the assignment/exam itself after it is graded. Requests must be made **within one week** of when we return the graded assignment/exam to class.
- *Make-up Policy:* Make-up exams for the midterms and the final will be given only if you have a written official documentation of a valid excuse and you contact me prior to the exam. If you cannot provide an official documentation do not ask me about a make-up exam.
- *Late Policy:* Late HW submissions will not be accepted under any circumstances. Unless you have an official documentation of a valid excuse covering the entire period of the assignment (HW out – HW due), please do not ask for an extension.
- *Attendance:* I do not keep track of the attendance, directly. I believe that you are old enough to decide what is best for you. It is your responsibility to stay abreast of the material presented in class.
- *Distractions:* This is a large class and I expect you to be extra careful not to cause any distraction in the classroom. Absolutely no phone calls or text messaging during the class. Also please be on time to the lectures. If you are more than a couple of minutes late do not enter the classroom.
- *Announcements:* Students are responsible following the announcements on the course web-page (<http://www.cise.ufl.edu/class/cot5405sp13/>). Schedule updates regarding the homeworks, exams and office hours will appear there.
- *Accommodations for Students with Disabilities:* Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the instructor when requesting accommodation.
- *The University's Honesty Policy:* All students admitted to the University of Florida have signed a statement of academic honesty committing themselves to be honest in all academic work and understanding that failure to comply with this commitment will result in disciplinary action. This statement is a reminder to uphold your obligation as a student at the University of Florida and to be honest in all work submitted and exams taken in this class and all others.
The following link contain additional information relating to academic honesty:
- <http://regulations.ufl.edu/chapter4/4041.pdf>