COT5405: 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 2018
• Schedule: T 3-4, R 4
• Location: NEB 0100
• Professor: Alper Üngör
  E534 CSE Building
• TAs: TBA
  (cot5405sp18@cise.ufl.edu)

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• Office hours:

• Web-page: http://www.cise.ufl.edu/class/cot5405sp18
• Prerequisites: COT3100, COP3530 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 three exams (each 30%), a programming project (5%) and a survey paper (5%). There will be non-graded homework assignments to enhance your learning and help you prepare for the exams. Also, the instructor will consider assigning bonus credit (up to 2%) based on attendance and participation.

- **Homeworks:** There will be 5-6 assignments, each consisting of 4-6 problems. Solutions will be provided, however they will not be graded.

- **Programming Project:** You will be asked to implement various algorithms in java or C++. Further details will be provided.

- **Survey Paper:** Students will be asked to write an original survey paper on a topic of their choice in Algorithms field. A list of potential topics and further guidelines will be provided mid semester.

- **Exams:** Exams are tentatively scheduled on Feb 13, March 27, April 24 evenings. Specific times and locations will be announced in class as the exam dates approach. All exams will be closed book.

- **Attendance:** is strongly encouraged as I will consider giving bonus points based on attendance and participation.

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:

- Recommended Textbooks:
  4. I will also distribute other papers and sources.

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

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.

- **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 UF E-learning (Canvas). 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](http://regulations.ufl.edu/chapter4/4041.pdf)