CSE 2331/5331

Foundations II: Data Structures and Algorithms

Summer, 2018

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Course Topics: Design/analysis of algorithms and data structures; divide-and-conquer; sorting and selection, search trees, hashing, graph algorithms, string matching; probabilistic analysis; randomized algorithms; NP-completeness.

Prerequisite: CSE 2231 and CSE 2321 and (Stat 3460 or STAT 3470).

Corequisite: MATH 3345.

Text(required): *Introduction to Algorithms, Third Edition*, by Corman, Leiserson, Rivest and Stein.

Course Notes: Slides will be posted on Carmen.

Midterm 1: Thursday, June 7, 8:00 - 10:00 p.m. in Mendenhall Lab 100
Midterm 2: Thursday, July 12, 8:00 - 10:00 p.m. in Mendenhall Lab 100
Final: Monday, July 30, 10:00 - 11:45 a.m. in Mendenhall Lab 100

Sequence of Topics(tentative):

1. Asymptotic notation review (CLRS, Chapter 3).
2. Analyzing algorithms review (CLRS, Chapters 1, 2).
3. Recurrence relations (CLRS, Sections 4.1, 4.2).
4. Probabilistic analysis (CLRS, Chapter 5).
5. Quicksort (CLRS, Chapter 7).
6. Median find (CLRS, Chapter 9).
7. Hashing (CLRS, Chapter 11).
8. Table doubling (CLRS, Sections 17.4).
9. Heaps (CLRS, Sections 6.1-6.4).
10. Binary Search Trees (CLRS, Chapter 12).
11. Red Black Trees (CLRS, Chapter 13).
12. Minimum spanning trees (CLRS, Chapter 23).
13. Shortest paths (CLRS, Section 24.3).
14. Union-find data structures (CLRS, Chapter 21).
15. Maximum Flow (CLRS, Sections 26.1-26.3).
16. NP-completeness (CLRS, Chapter 34).

Grading Scheme:
Participation 4%, Homework 14%, Programming Assignments 4%, Midterm 1 20%, Midterm 2 20%, Final 38%.

General Information:
Homework is due at the beginning of class. Late homework will not receive credit.

Information regarding the course will be posted on Carmen. CSE 2331 is not an online course. Students are expected to attend class regularly. In the event that a student must miss a class, the student is responsible for finding out what assignments were made, what due dates were announced, and what material was covered. Students are also expected to sign the attendance sheet, failure to do so will result on the student

being recorded as absent in the class.

Piazza, www.piazza.com, will be used to post announcements and as a student discussion platform for the course. Some examples of acceptable topics to discuss include: general information, concepts as related to assignments, interpretation of assignments, problems with coding such as syntax and execution errors, etc. Please do not post answers or partial answers to homework problems. Do not post any code from programming assignments. Piazza will be monitored by the course grader and/or instructor. Students are responsible for any announcements and information provided on Piazza.

Academic Misconduct:
Students are required to follow the Ohio State Code of Student Conduct which can be found at `http://studentaffairs.osu.edu/pdfs/csc_12-31-07.pdf`. Among the other restrictions, pay specific attention to the section on Academic Misconduct. Among the restrictions, students are prohibited from:

- Providing or receiving information during exams.
- Providing or receiving assistance on homework and lab problems other than as outlined above for Piazza.
- Submitting plagiarized (i.e. copied but unacknowledged) work for credit.

Note: Faculty is required by the University to report any suspected violation of these conditions to the Council on Academic Misconduct. Misconduct cases are resolved via the CoAMs hearing processes. More about this process can be found at: `http://oaa.osu.edu/coam.html`.