CSE 2331
Foundations II: Data Structures and Algorithms
Spring, 2019

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

PRE-REQUISITE: CSE 2231 and CSE 2321 and (STAT 3460 or STAT 3470).

CO-REQUISITE: MATH 3345.

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

COURSE NOTES: Electronic copy posted on carmen.

CARMEN: `https://carmen.osu.edu`.

EXAMS:
Midterm I: Thurs, Feb. 14, 8-10 p.m., 35 Hitchcock
Midterm II: Thurs, Mar. 28, 8-10 p.m., 35 Hitchcock
Final exam: Tues, Apr. 30, 6-7:45 p.m.

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. Heaps (CLRS, Sections 6.1-6.4).
9. Binary Search Trees (CLRS, Chapter 12).
10. Red Black Trees (CLRS, Chapter 13).
11. Minimum spanning trees (CLRS, Chapter 23).
12. Shortest paths (CLRS, Section 24.3).
13. Maximum Flow (CLRS, Sections 26.1-26.3).
14. Table doubling (CLRS, Sections 17.4).
15. Union-find data structures (CLRS, Chapter 21).
16. NP-completeness (CLRS, Chapter 34).

(over)

REVIEW EXERCISES: Posted on carmen⇒CSE2331⇒Modules⇒Exercises.

VIDEOS:

- Videos of review session: Posted on carmen⇒CSE2331⇒Modules⇒Review session videos.
- Videos of Autum, 2017, lectures: Posted on carmen⇒CSE2331⇒Modules⇒ Videos of Lectures.

GRADING:

Attendance 5%, Homeworks 15%, Midterm I 20%, Midterm II 25%, Final 35%.

Homeworks may include programming assignments.

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. Late homework will NOT receive credit.