



中央民族大学
MINZU UNIVERSITY OF CHINA

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Minzu University of China
CS202 Analysis of Algorithms
Summer 2020

Basic Information

Class hours: Monday through Thursday, 2 hours each day
Discussion: Friday, 1 hour (60 minutes)
Review Section: Saturday, 1 hour (60 minutes)
Office Hour: 2 hours (According to professors' teaching plan)
Field trip: According to professors' teaching plan
Credit: 4
Total contact hours: 60 (50 minutes each)
Instructor: TBA

Prerequisites

Undergraduate courses in discrete mathematics and programming (preferably C or Java). Programming assignments will be given during the course. Students are expected to be proficient and able to code in one of the commonly-used programming languages such as C or Java. Code examples discussed in the course will be in C.

Description

The course will introduce the students to computer algorithms that are used to solve many practical everyday problems. Students will learn to design the algorithms and analyze their efficiency. Students will learn to implement algorithms in computer code using the C language or any other suitable and commonly-used programming language.

Objectives and Outcomes

The main objective of this course is to recognize and understand the general classes of algorithms and techniques that are used for solving practical computationally-intensive problems. Another objective is to learn to implement the algorithms in common programming languages. Students who successfully complete the course will be able to solve many practical problems in business, engineering and software development.

Textbook:

Introduction to Algorithms, 3rd edition, MIT Press, Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, Clifford Stein

Teaching Methods

- Lectures: Important materials from the text will be covered in class. Students should plan to take careful notes. Class discussion is encouraged
- Homework: Three programming assignments will be given to reinforce materials in the class
- Quizzes (“Short tests during class”): Occasional unannounced quizzes will be given to help ensure students keep up with assigned materials. Up to 5 quizzes will given in class
- Exams: Two exams will be given. Each exam will be closed book/notes/computer/smart phone, and will test materials discussed in class. The midterm exam is scheduled on 7/30/20. The Final exam is on 8/13/20 The Final Exam is comprehensive
- Participation: Class attendance is mandatory
- Teaching Assistant: The TA will be available each Friday for 1 hour “Discussion” and “review Section”



Course Policies

Missed Classes: The student is responsible for obtaining material discussed or distributed in class when he/she was absent. This can be done through contacting a classmate who was present or by contacting the instructor during his office hours. Missed or late quizzes (ie, “short tests during class”), tests or exams cannot be made up under any circumstances but with good cause and adequate notice, an early quiz may be given. One quiz (lowest score) will be dropped at the end of the semester.

Assignments: All assignments are due at the beginning of class on the date due. Late submission of assignments will be assessed a penalty of 10% per day. No exceptions are made.

Academic Dishonesty: Plagiarism and cheating are serious offenses and may be punished by failure on exam, or failure in course. For more information refer to the "Principles of Academic Integrity" in the official course syllabus and the policy in the University Undergraduate Catalog. For this class, it is permissible to assist classmates in general discussions of computing techniques. General advice and interaction are encouraged. Each person, however, must develop his or her own solutions to the assigned exercises for quizzes, tests and exams. In other words, students should not "work together" on graded assignments.

Need for Assistance: If you have any condition, such as a physical or learning disability, which will make it difficult for you to carry out the work as I have outlined here and in the official course syllabus, or which will require academic accommodations, please notify your Summer 2020 Academic advisor/office as soon as possible.

Incomplete Policy: Students will not be given an incomplete grade in the course. In any case, for a student to receive an incomplete, he or she must be passing and must have completed a significant portion of the course.

Grading

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| Exercises (short tests during class, 5 tests 4% each): | 20% |
| Homework (3 programming assignments, 10% each): | 30% |
| Midterm Exam (Week 3): | 20% |
| Final Exam: (Week 5) | 30% |

Final Grade Scale

A+ 97-100; A 94-96; A- 90-93;
 B+ 87-89; B 84-86; B- 80-83;
 C+ 77-79; C 74-76; C- 70-73;
 D+ 67-69; D 64-66; D- 60-63;
 F < 60

Course Plan

| Week | Topic | Assignment/Test/Exam Due Date |
|------|---|-------------------------------|
| 1 | Introduction to algorithms | |
| | Elementary algorithms (Sorting, Binary Search Trees) | |
| | Implementing algorithms in computer code (Python, C, C++, Java) | |
| | <i>Homework No. 1 available 7/16/20</i> | Due 7/10/20 (11:59 pm) |
| | Asymptotic notations | |
| 2 | Run-time analysis, efficiency, optimization | |
| | Data structures | |
| | <i>Homework No. 2 available 7/23/20</i> | Due 7/26/20 (11:59 pm) |
| 3 | Data structures continued | |



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| | Quasi-random numbers and randomized algorithms (Monte Carlo) | |
| | Midterm Exam on 7/30/20 | 7/30/20 |
| | <i>Homework No.3 available 7/30/20</i> | <i>Due 8/4/20 (11:59 pm)</i> |
| 4 | Greedy Algorithms | |
| | AVL Trees | |
| 5 | Divide and Conquer algorithms | |
| | Applications | |
| | Review and outlook | |
| | Final Exam on 8/13/20 | 8/13/20 |

All items in the syllabus and this supplemental syllabus are subject to change at the discretion of the Instructor and the Office of Academic Affairs.