

COSC 3P03: Design and Analysis of Algorithms

- Instructor: [Ke Qiu](#)
- Time and Location: Tuesday and Thursday 5:00-6:30 PM, TH 246.
- Office: J306
- Office Hours: TBA and by appointment.

General Objectives

This is a course on the design and analysis of computer algorithms. It will include the following topics: lower and upper bounds for algorithms and problems, solving recurrences, advanced data structures, algorithm design techniques (divide and conquer, greedy algorithms, and dynamic programming), and an introduction to NP-completeness. The algorithms covered include algorithms for sorting and searching, graphs, strings, and various combinatorial optimizations.

Learning Outcomes

-

Content

1. Understand that some problems have no algorithmic solution
2. Recognize problems have certain lower bounds
3. Describe major algorithm design techniques

Skills

4. Use and solve recurrences for recursive algorithms
5. Design, analyze, compare and explain algorithms.
6. Classify problems and apply appropriate algorithm design techniques.
7. Classify problems into complexity classes and perform polynomial reduction.

Values

8. Recognize the relationship between real-life problems and classical/combinatorial problems or their combinations

Recommended Textbook

Introduction to Algorithms, McGraw-Hill,

1st Ed., T. Cormen, C. Leiserson, and R. Rivest.

2nd Ed., T. Cormen, C. Leiserson, R. Rivest, and C. Stein.

Exams

One midterm on Feb. 11, Thursday (in class). One final exam.

A cheat sheet is allowed for both the midterm and final. For the ultimate cheat sheet in theoretical computer science, see [here](#).

Assignments

Assignments are to be handed in by 5:00 PM on the due date specified. Late assignment will be accepted up to one day with a penalty of 50%.

You may discuss assignments with your fellow students. But, please remember not to share solutions. The work you submit must be your own. When submitting an assignment, please follow the general rules for computer science students. Specifically, a standard computer science [cover page](#) should be included.

Assignment Schedule

-

Assignment	Out Date	Due Date	Solutions
A1	Jan. 15	Jan. 28	A1 Solu
A2	Jan. 30	Feb. 10	A2 Solu
-			
			-

Cheating

Cheating in any form will not be tolerated and will be dealt with severely. The penalty is given as follows: Let n be the total mark for an assignment/exam, your mark for this assignment/exam will be $-n$. A second offence will result in a failing grade for the course. In both cases, the incident will be reported to the department and the registrar's office.

Marking Scheme

The marking scheme is as follows: 30% Assignments + 30% Midterm + 40% Final.

A minimum of 40% on the final is required in order to receive a passing grade.