School of Computer Science
University of Guelph

CIS*3490 The Analysis and Design of Algorithms

Winter 2022

Instructor

Fangju Wang, 3304 Reynolds, X52939, cis3490@socs.uoguelph.ca (for all emails related to CIS*3490W22 teaching)

Teaching Assistants:

To be announced on course Moodle page.

Course Objective and Topics

The objective of this course is to teach *theory* and *techniques* for designing and analyzing computer algorithms for solving problems, and many widely-used algorithms. The design techniques include divide-and-conquer, decrease-and-conquer, transform-and-conquer, dynamic programming, greedy techniques, iterative improvement, backtracking, and branch-and-bound. We study algorithms for manipulating data structures of lists, matrices, trees, graphs, etc. and algorithms for solving problems including sorting, searching, string processing, etc. We also study mathematical methods for algorithm efficiency analysis, and discuss the problem of NP-completeness.

Course Delivery Methods:

Course lectures are asynchronous with slides developed in Voice-Over-PPT. Weekly labs may be in-person or online, directed by the University. There are no office hours. Students can ask questions at the Discussion Forum on our Moodle page. Students can also ask questions in labs.

Lab Schedule

0101: Mon 12:30pm-02:20pm MCKN231
0102: Thur 09:30am-11:20pm MCKN226
0103: Wed 07:00pm-08:50pm MCKN226
0104: Wed 03:30pm-05:20pm MCKN227
0105: Mon 07:00pm-08:50pm MCKN227
0106: Tues 08:30am-10:20am MCKN231

Week of		Week of		Week of		Week of	
Jan 10	N	Jan 17	N	Jan 24	Y (A1)	Jan 31	Y (A2)
Feb 7	Y (A2)	Feb 14	N	Feb 28	Y (A3)	Mar 7	Y (A3)
Mar 14	Y (A4)	Mar 21	Y (A4)	Mar 28	Y (A5)	Apr 4	Y (A5)

Y – labs in the week; **N** – no labs in the week.

Textbook:

- A. Levitin, *Introduction to the Design and Analysis of Algorithms* (3rd Edition), Pearson Education Inc, 2012.

The textbook is **required**. Lectures will closely follow the book contents. Assignments and exercises will include questions in the book.

Course Moodle Page URL

http://moodle.socs.uoguelph.ca/

Assignments

- Five assignments: $20\% \times 5 = 100\%$

Evaluation Schedule

Assignment	**due** time	Grades posted by
1	08:00am, Monday, January 31, 2022	Febrary 14, 2022
2	08:00am, Monday, February 14, 2022	March 7, 2022
3	08:00am, Monday, March 14, 2022	March 28, 2022
4	08:00am, Monday, March 28, 2022	April 11, 2022
5	08:00am, Monday, April 11, 2022	April 18, 2022

Policies

Policy on Late Assignment Submissions

- For each assignment, the submission box is closed at the cut-off time right after the due time. Assignments submitted into the box will be graded.
- An assignment that is not submitted into the submission box will not be graded, even if the time stamps of its files are not later than the due time.

Policy on Re-Grading Assignments

- To request re-grading an assignment, you must email the request within ten calendar days after the grade is posted on Moodle. For example, if the grade is posted on March 1, you must request re-grading by March 11.
- Only an **unchanged** assignment submitted to Moodle by the due time can be re-graded. "Unchanged assignment" means that no file is added/replaced and not a single character is changed in a file of the assignment (including the makefile).

- To request re-grading an assignment, please email the TA who grades your assignment. If you are not satisfied with the re-grading result, please email the next TA on the TA list (circularly) to request the second re-grading. If you are still unsatisfied with the second re-grading result, please email your request to the instructor. The instructor may ask a different TA to re-grade the assignment. In short, email your first two re-grading requests to the TAs directly, NOT to the instructor. Email your third request to the instructor.

Policy on Academic Considerations

- When you find yourself unable to meet an assignment due time because of an illness or compassionate reason, please email the instructor to request an academic consideration (including assignment extension, weight adjustment, etc.) **before** the due time, with your name, id#, and supporting documents (if available). See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

- Academic Considerations will not be granted for reasons of heavy work loads or exams of other courses.

Policy on Using Code from the Internet

- For programming assignments of this course, you are **not** allowed to use any code on the Internet, no matter if you wrote it before and no matter if you cite the source. **Write your code for the assignments of this course.**

Statements

- **E-mail Communication**
  As per university regulations, all students are required to check their `<mail.uoguelph.ca>` e-mail account regularly: e-mail is the official route of communication between the University and its students.

- **Accessibility**
  The University promotes the full participation of students who experience disabilities in their academic programs. To that end, the provision of academic accommodation is a shared responsibility between the University and the student.

  When accommodations are needed, the student is required to first register with Student Accessibility Services (SAS). Documentation to substantiate the existence of a disability is required, however, interim accommodations may be possible while that process is underway.

  Accommodations are available for both permanent and temporary disabilities. It should be noted that common illnesses such as a cold or the flu do not constitute a disability.

  Use of the SAS Exam Centre requires students to book their exams at least 7 days in advance, and not later than the 40th Class Day. More information: `www.uoguelph.ca`sas/.

- **Academic Misconduct**
  All the assignments in this course are individual assignments. You must complete each assignment independently. All programming assignment submissions will go through **similarity checking**.

  The University of Guelph is committed to upholding the highest standards of academic integrity and it is the responsibility of all members of the University community faculty, staff, and students to be aware of what constitutes academic misconduct and to do as much as possible to prevent academic offences from occurring. University of Guelph students have the responsibility of abiding by the University's policy on academic misconduct regardless of their location of study; faculty, staff and students have the responsibility of supporting an environment that discourages misconduct. Students need to remain aware that instructors have access to and the right to use electronic and other means of detection.

  Whether or not a student intended to commit academic misconduct is not relevant for a finding of guilt. Hurried or careless submission of assignments does not excuse students from responsibility for verifying the academic integrity of their work before submitting it.

  Students who are in any doubt as to whether an action on their part could be construed as an academic offence should consult with a faculty member or faculty advisor.

  The Academic Misconduct Policy is detailed in the Undergraduate Calendar.