

CIS*3490 The Analysis and Design of Algorithms

Winter 2020

This Course outline is revised on March 22, 2020. The effective date is March 23, 2020.

Instructor

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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 commonly 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 discuss algorithms for manipulating data structures of lists, matrices, trees, graphs, etc. and for solving problems like sorting and searching. We also study mathematical methods for analyzing non-recursive and recursive algorithms, and discuss the problems of NP-completeness.

Lab Schedule

0101: Mon 03:30pm-05:20pm MCKN227 0102: Fri 11:30am-01:20pm MCKN229
0103: Tues 07:00pm-08:50pm MCKN224 0104: Thur 08:30am-10:20am MCKN227
0105: Mon 07:00pm-08:50pm MCKN228

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|---------|--------|---------|---------|---------|--------|---------|--------|
| Week of | | Week of | | Week of | | Week of | |
| Jan 6 | N | Jan 13 | N | Jan 20 | Y (A1) | Jan 27 | N |
| Feb 3 | Y (A2) | Feb 10 | N | Feb 24 | N | Mar 2 | Y (A3) |
| Mar 9 | N | Mar 16 | Y (A4)* | Mar 23 | N | Mar 30 | N |

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

Teaching Assistants

TBA. cis3490@socs.uoguelph.ca, TA advising hours: Not in the weeks after March 23, 2020.

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 and Examinations

- Five assignments: $10\% + 10\% + 10\% + 10\% + 10\% = 50\%$
- Midterm examination: 20%

The **late policy** for assignments is: **NO** late assignment will be accepted.

The total mark is 70%. It will be scaled to 100%.

Evaluation Schedule

- Midterm examination: Monday, February 24, 2020 (02:30pm – 03:20pm).
- Assignment **due** dates:
 - Assignment 1: Monday, January 27, 2020
 - Assignment 2: Monday, February 10, 2020
 - Assignment 3: Monday, March 9, 2020
 - Assignment 4: Monday, March 30, 2020
 - Assignment 5: Friday, April 10, 2020

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.

- **When You Cannot Meet a Course Requirement**

When you find yourself unable to meet an in-course requirement because of illness or compassionate reasons, please advise the course instructor (or designated person, such as a teaching assistant) in writing, with your name, id#, and e-mail contact. See the undergraduate calendar for information on regulations and procedures for Academic Consideration.

- **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.casas/.

- **Academic Misconduct**

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.

Please note: For programming assignments of this course, you are NOT allowed to use any code on the Internet, no matter who wrote it and no matter you cite the source or not. **Write your code for the assignments of this course.**

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.

- **Recording of Materials**

Presentations which are made in relation to course work, including lectures, cannot be recorded or copied without the permission of the presenter, whether the instructor, a classmate or guest lecturer. Material recorded with permission is restricted to use for that course unless further permission is granted.

- **To Appeal a Mark**

To appeal a mark of an assignment or the midterm examination you must do so within two weeks after it is returned.