



CIS*1910 Discrete Structures in Computing (I)

F24 (3-2) [0.50]

Course Outline

Website:

See *CourseLink*.

Lectures:

TUE, THU, 10:00am to 11:20am, ROZH 104

First lecture Sep 5, last one Nov 28, no lecture Oct 15

Labs:

1 - FRI, 12:30pm to 2:20pm, MCKN 317

2 - THU, 2:30pm to 4:20pm, MCKN 314

3 - WED, 12:30pm to 2:20pm, MCKN 311

4 - WED, 9:30am to 11:20am, MCKN 304

5 - THU, 12:30pm to 2:20pm, MCKN 309

6 - WED, 3:30pm to 5:20pm, MCKN 310

7 - TUE, 11:30am to 1:20pm, MCKN 309

8 - FRI, 8:30am to 10:20am, MINS 037

9 - MON, 12:30pm to 2:20pm, MCKN 305

10 - MON, 8:30am to 10:20am, MCKN 305

11 - TUE, 2:30pm to 4:20pm, MCKN 316

12 - MON, 7:00pm to 8:50pm, ROZH 106

13 - TUE, 7:00pm to 8:50pm, MCLN 101

14 - WED, 7:00pm to 8:50pm, ROZH 106

15 - FRI, 2:30pm to 4:20pm, MCKN 304

16 - THU, 4:30pm to 6:20pm, MCLN 101

First lab Sep 5, last one Nov 27, no labs Oct 10-16

The set of exercises covered in the labs changes every Thursday.

Office Hours:

1 - TUE, 1:00pm to 3:00pm, Sep 10 to Nov 26, except Oct 15

2 - THU, 1:00pm to 3:30pm, Sep 12 to Nov 28

3 - FRI, 11:30am to 2:30pm, on Sep 27, Oct 11 and 25, Nov 15 and 29 only

4 - TUE, 1:00pm to 5:00pm, on Dec 3 only

All office hours will be held in REYN 0004. Note that this classroom is a study space dedicated to CIS*1910.

Instructors:

Daniel Gabric, Pascal Matsakis

Teaching Assistants:

Aly Sibak, Evan Glaizel, Jaskirat Singh Sohal, Kasra Sina, Noel Johnston, Or Brener, Rachel Pereira, Thurshan Subaskody, Tulio Batista Martins, Vishvam Porwal, Yousuf Mohiuddin

Contact:

- 1 – cis1910a@socs.uoguelph.ca (Or Brener, lead teaching assistant) for questions regarding the course material, i.e., lectures, labs, assignments, midterm and *zyBook*. These questions should be brief and require short answers (such as yes or no). For other questions about the course material, you are encouraged to attend office hours or use the *Discussions* tool on *CourseLink*.
- 2 – cis1910b@socs.uoguelph.ca (Yousuf Mohiuddin, lead marker) for regrade requests and other questions regarding your grades.
- 3 – pmatsaki@uoguelph.ca (Pascal Matsakis, lead instructor) for all other issues, e.g., course delivery, evaluation method, conflict with a teaching assistant, personal issues, administrative issues.

Description

Synopsis

This course is an introduction to discrete structures and formal methodologies used in computer science, including Boolean algebra, propositional logic, predicate logic, proof techniques, set theory, equivalence relations, order relations, and functions.

Topics

Unary / binary operations on a set, Boolean algebra / expressions, fundamental laws, duality principle; Propositional logic, propositions, logical operations / equivalences, truth tables, conjunctive / disjunctive normal form; Predicate logic, predicates, quantifiers, combining / negating predicates, nested quantifiers; Rules of inference, direct / existence / uniqueness proofs, proofs by contraposition / contradiction / cases / induction; Set builder notation, cardinality, power sets, set operations, Venn diagrams, Cartesian product, tuples; Binary relation over two sets / on a set, inverse / composite of binary relations; Equivalence relations / classes, partitions; Partial / total order relations, Hasse diagrams, maximal / minimal elements, greatest / least elements, upper / lower bounds, supremum / infimum; Partial / total functions, image / preimage of a set under a function, injections, surjections, bijections, inverse / composite of functions, sum / product of real functions, monotonicity of real functions of a real variable; Numeral systems, base b expansion, base conversion

Learning Outcomes

On successful completion of this course, you will be able to:

- use Boolean algebra laws to derive other laws and to manipulate and complement Boolean expressions;
- relate Boolean algebra to logic and sets;
- apply formal methods of symbolic propositional and predicate logic, and informal but rigorous logical reasoning;
- give examples of the appropriate use of fundamental proof methods, including weak vs. strong induction;
- perform basic operations associated with sets, functions and relations;
- perform basic arithmetic operations in and conversions between binary, octal, hexadecimal, and decimal number systems;
- explain the use and importance of all the concepts and tools above in computer science and in modelling real-life situations.

Required Text

zyBook, CIS*1910: Discrete Structures in Computing I

1. Sign in or create an account at learn.zybooks.com
2. Enter *zyBook* code: UOGUELPHCIS1910MatsakisFall2024
3. Subscribe

A subscription is \$64. Subscriptions will last until Jan 14, 2025.

Note that some topics will not be discussed in class but will be covered in the *zyBook*. Also, some topics covered in the *zyBook* should be ignored. All these topics will be clearly indicated in the *zyBook* via instructor notes.

Additional Resources

- Rosen, Discrete Mathematics and Its Applications, Mc Graw Hill
- Stein, Drysdale and Bogart, Discrete Mathematics for Computer Scientists, Addison Wesley
- Gossett, Discrete Mathematics with Proof, Wiley

Evaluation

Grading Components

Participation and challenge activities (2% BONUS)

By 11:59pm the day before each lecture, you are expected to have read certain sections of the *zyBook* and completed the related participation and challenge activities. This reading assignment, which will help you understand the lecture, will be indicated at the bottom of the last slide covered in the previous lecture.

Assignments (20%)

There will be four assignments, each weighted equally (5%). Each assignment will consist of an online quiz and the submission of a *pdf* file. The file must be uploaded via the *Dropbox* tool in *CourseLink*, and the order of questions must be preserved. It is your responsibility to ensure that your answers are easily legible; any answer that is not easily legible may receive a mark of zero. Note that you will receive a zero if you mistakenly submit the wrong file or if the uploaded file is corrupted. Therefore, you are encouraged to download the file after uploading it to ensure there are no issues.

Midterm Examination (30%)

This is a closed-book test on all material covered in the *zyBook*, lectures, and lab classes.

Final Examination (50%)

This is a closed-book test on all material covered in the *zyBook*, lectures, and lab classes. You must pass the exam (i.e., achieve a grade of 50% or higher) to pass the course. If you do not pass the final exam, the maximum grade you can receive in the course is 49%.

Regrade Requests

If you feel you deserve a better grade on an assignment or the midterm exam, you may submit a regrade request. The request must be emailed to the lead marker and received within seven calendar days of the grade being posted on *CourseLink*. You are therefore encouraged to review the solutions as soon as possible to ensure that your work has been graded correctly and your grade recorded accurately. The request must include a clear and well-reasoned explanation of why you feel the original grade was unfair. Note that a regrade request may result in your entire work being regraded, and the revised grade may be higher or lower than the original.

Deadlines

Participation and challenge activities

The relevant activities must be completed by 11:59pm the day before each lecture. Excuses for missed activities and requests for extensions will not be accepted.

Assignments

Assignment 1:	Wed Sep 25, 11:59pm
Assignment 2:	Wed Oct 09, 11:59pm
Assignment 3:	Wed Nov 13, 11:59pm
Assignment 4:	Wed Nov 27, 11:59pm

You are strongly encouraged to meet the deadlines. However, the quiz portion of an assignment may be taken and the *pdf* file submitted up to three days late without penalty (i.e., you may finish the quiz or upload the file by Sat 11:59pm instead of Wed 11:59pm). A student registered with SAS will be granted an additional four-day extension if requested by their SAS advisor (who should then email the lead instructor). Requests for further extensions will not be accepted. Excuses for missed assignments will only be considered under exceptional circumstances and must be presented to the lead instructor as soon as possible. The only remedy for a missed assignment is a redistribution of its weight to other components (at the discretion of the lead instructor). Note that a failing laptop or Wi-Fi connection is not an acceptable excuse. Therefore, you are encouraged to frequently back up your work and to take the quiz and upload your file ahead of time.

Examinations

Midterm examination: Fri Oct 25, 7:30pm-9:30pm, location TBD
Final examination: Wed Dec 4, 8:30am-10:30am, location TBD

Excuses for a missed midterm exam will only be considered under exceptional circumstances and must be presented to the lead instructor as soon as possible, with all supporting documentation. The remedies available for a missed midterm exam are a redistribution of its weight to the final exam or a make-up midterm exam (at the discretion of the lead instructor).

For a missed final exam, please see: <https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/deferred-assessments/>

Other

Communication

Check the course website and your <uoguelph.ca> email account regularly. Use your <uoguelph.ca> account (not any other account) to contact the lead teaching assistant, marker or instructor.

Electronic Devices

Turn off and store away all electronic devices (e.g., laptops, tablets, calculators, mobile phones, cameras, video recorders, audio recorders) before you walk into the classroom. The only exceptions are devices used with a stylus for note-taking. Note-taking must then be the only use of the device. Photos, videos and audio recordings are not permitted during lectures and labs.

Academic Misconduct

You are expected to work on each problem on your own and present your own solution. 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: 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. Please review the Academic Misconduct Policy detailed in the Undergraduate Calendar: <https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/academic-misconduct/>

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 make a booking at least 7 days in advance, and no later than November 1 (fall), March 1 (winter) or July 1 (summer). Similarly, new or changed accommodations for online quizzes, tests and exams must be approved at least a week ahead of time. Please see: <http://www.uoguelph.ca/sas>

Drop Date

The last day to drop CIS*1910 is Nov 29, 2024. The regulations and procedures for dropping courses are available here: <https://calendar.uoguelph.ca/undergraduate-calendar/undergraduate-degree-regulations-procedures/dropping-courses/>

Tutoring

If you would like to hire a tutor, please check:
<https://www.uoguelph.ca/uaic/acadsupport-tutoring/>

Resources

The Academic Calendars (<https://www.uoguelph.ca/registrar/calendars/>) are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs.