School of Computer Science

# CIS*1910

# Discrete Structures in Computing I

Winter 2018

## 1 Instructional Support

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|---|---|
| Instructor: James Fraser<br>Office: J.D. MacLachlan 209 | Email: jfrase09@uoguelph.ca<br>Office hours: Thursday: 4-5pm |
| Teaching Assistants:<br>Chul Jung — Omar Khan<br>Timothy Martin — Evan Sala<br>Mohamed Zayed | Email: cis1910@socs.uoguelph.ca<br>For questions and regrades requests |

### .1 Timetables

Lecture Time:

Tuesday and Thursday: 11:30-12:50pm (MCLN 102)

Tuesday and Thursday: 2:30-3:50pm (MCLN 102)

Labs Times:

101: Monday 7:00-8:50 PM (MINS 017)

102: Wednesday 3:30-5:20 PM (MINS 017)

103: Wednesday 12:30-2:20 PM (MCKN 236)

104: Wednesday 9:30-11:20 AM (MCKN 238)

205: Friday 12:30-2:20 PM (MCKN 236)

206: Monday 3:30-5:20 PM (MCKN 234)

207: Monday 11:30 AM - 1:20 PM (MINS 017)

208: Tuesday 8:30-10:20 PM (MCKN 234)

## 2 Learning Resources

### 2.1 Course Website

Course material, news, announcements, assignments, and grades will be regularly posted to the CIS*1910 website which can be found at **www.courselink.uoguelph.ca**. **You are responsible for checking the site regularly.**

### 2.2 Course Textbook

This course will use an online and interactive textbook from zybooks.zyante.com.

- To get the textbook follow these instructions:
  - Sign up at zyBooks.com
  - Enter zyBook code: UOGUELPHCIS1910FraserWinter2018
  - Click Subscribe

### 2.3 Supplemental Textbook

Rosen H. Kenneth, Discrete Mathematics and Its Applications (7th-edition), McGraw-Hill Education, 2011

### 2.4 Calendar Description

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.

The Academic Calendars are the source of information about the University of Guelph's procedures, policies and regulations which apply to undergraduate, graduate and diploma programs: http://www.uoguelph.ca/registrar/calendars/index.cfm?index

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## 3 ASSESSMENT

### 3.1 Dates and Distribution

| | ***Assessments*** | ***Weight*** | |
|---|---|---|---|
| Assignments (4 in total) | Sundays 11:55pm<br>A1 Jan 21st<br>A2 Feb 4th<br>A3 Feb 18th<br>A4 Mar 18th<br>A5 Apr 1st | **50%**<br>10% each<br>*Dropbox* | |
| Midterm | March 6th, 2018<br>In-Class | **20%** | 20% (4*5% ) |
| Final exam | April 20th, 2018<br>7 – 9 PM<br>( Room TBA) | **30%**<br>Cumulative exam | 40% (4*10%) |

### 3.2 Course Grading Policies

**Academic Consideration**: There are no makeup assignments. If you are unable to meet an in-course requirement due to medical, psychological, or compassionate reasons, please make an appointment to discuss with your course instructor. Please see below for specific details and consult the undergraduate calendar for information on regulations and procedures for Academic Consideration: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-ac.shtml

**Late Assignments**: Assignments are due on Sunday evenings at 11:55 pm. Late assignments are penalized at 1% per

hour (or a portion of an hour) late. Assignments that are more than 72 hours late will not be graded and will be assigned a grade of zero.

**Regrades**: Students may request a regrade for assignments or examinations. The original submission will be entirely regraded and a new mark will be assigned. It is possible for a mark to go down, go up, or remain unchanged as a result of a regrade. Students must request a regrade via email within a week of receiving the assignment grade. All regrade requests must include the following information

1) Your name
2) Email title: "Requesting regrade for Assignment#N"
3) Questions Number(s)
4) Clear description of why the regrade is being requested

****Regrade requests without this information will not be regraded****

**Accommodation of Religious Obligations**: If you are unable to meet an in-course requirement due to religious obligations, please email the course email address **within two weeks of the start of the semester** to make alternate arrangements. See the undergraduate calendar for information on regulations and procedures for Academic Accommodation of Religious Obligations: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-accomrelig.shtml

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# 4 TEACHING AND LEARNING ACTIVITIES

## 4.1 Learning Outcomes

By the end of this course successful students should be able to:

**Knowledge and Understanding:**

- understand the basics of logic, sets, functions and Boolean algebra.
- write and interpret mathematical notation.
- transform statements from common language to formal logic.
- understand the notion of mathematical thinking and mathematical proofs.

**Personal Development:**

- demonstrate the ability to use truth tables and the rules of inference.
- demonstrate the ability to use techniques for constructing mathematical proofs.
- demonstrate a working knowledge of set notation and elementary set theory.
- apply the concepts learnt in problem-solving.

## 4.2 Lecture Topics

Below is a preliminary list of topics covered. These may be updated as the course progresses. In order to do well in this course, it is strongly suggested that you both complete the readings, the labs and attend the lectures.

- Propositional logic, propositions, logical operations, equivalences, truth tables, conjunctive, disjunctive normal form
- Predicate logic, predicates, quantifiers, combining and 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 or on a set, inverse and composite of binary relations
- Equivalence relations, classes, partitions
- Function: Partial, total functions, image, preimage of a set under a function, injections, surjections, bijections, inverse, composite of functions, sum and product of real functions, monotonicity of real functions of a real variable

- Numeral systems, base b expansion, base conversion
- Unary and binary operations on a set, Boolean algebra, expressions, fundamental laws, duality principle

### 4.3 Important Dates

January 8th: First day of class
February 19th: Start of winter break
March 9th: 40th class day (Last day to drop course)
April 5th: Last day of CIS*1910
April 6th: Classes conclude
April 9th: Examination period starts
April 20th: Examination period ends

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## 5 ROLES AND RESPONSIBILITIES

### 5.1 Communication & Email Policy

Major announcements will be posted to the course website and the discussion forums. **It is your responsibility to check the course website regularly.** 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.

### 5.2 Redistribution of Materials

Presentations which are made in relation to coursework—including lectures—cannot be recorded or copied without the permission of the presenter, whether the instructor, classmate or guest lecturer. Material recorded with permission is restricted to use for that course and may not be posted on any public space unless further permission is granted.

### 5.3 Instructor's Role and Responsibility to Students

The instructor's role is to develop and deliver course material in ways that facilitate learning for a variety of students. Notes will be made available to students on the course website but are not intended to be stand-alone. The online discussions, assignments, labs, and the e-textbook are all important components of this course.

### 5.4 Students' Learning Responsibilities

Students are expected to take advantage of the learning opportunities provided during lectures, labs and help sessions. Students, especially those having difficulty with the course content, should also make use of other resources recommended by the instructor. Students who fall behind due to illness, work, or extra-curricular activities are advised to keep the instructor informed as early as possible. This will allow the instructor to recommend extra resources in a timely manner and/or provide consideration if appropriate.

### 5.5 Drop Date

The last date to drop one-semester courses, without academic penalty, is Friday, March 9th, 2018. For regulations and procedures for Dropping Courses, see the Undergraduate Calendar: http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-drop.shtml

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## 6 ACADEMIC INTEGRITY

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. All students who take a SOCS course must pass the **Academic Integrity Self-Test**.

For educational purposes, instructors impose conditions on assignments that may limit students' permission to collaborate with others or to utilize external sources (including, but not limited to, software, data, images, text, etc.).

Any permitted utilization must be done with proper references. Aiding and abetting is a punishable offence; students must be careful not to help others commit offences by giving out solutions or providing to access computer accounts. Instructors may use automated tools to detect possible cases of academic misconduct.

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.

The Academic Misconduct Policy is detailed in the Undergraduate Calendar:
http://www.uoguelph.ca/registrar/calendars/undergraduate/current/c08/c08-amisconduct.shtml

The SOCS Academic Integrity Unit:
http://moodle.socs.uoguelph.ca/course/view.php?id=2 Login with your central login credentials.

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# 7 ACCESSIBILITY

The University of Guelph is committed to creating a barrier-free environment. Providing services for students is a shared responsibility among students, faculty, and administrators. This relationship is based on respect for individual rights, the dignity of the individual and the University community's shared commitment to an open and supportive learning environment. Students requiring service or accommodation, whether due to an identified, ongoing disability, or for a short-term disability should contact Student Accessibility Services (SAS) as soon as possible.

For more information, contact SAS at 519-824-4120 ext. 56208 or email csd@uoguelph.ca or see the website:
http://www.uoguelph.ca/csd/