Department of Mathematics and Statistics
MATH/CSCI 2112
Discrete Structures I
Winter 2018

1 General information

Lectures:	MWF 11:35 – 12:25	LSC Common Area C242
Instructor:	Neil J. Ross	neil.jr.ross@dal.ca
Office hours:	W 15:00 – 16:30	Chase building room 213

2 Course description

This course, together with MATH/CSCI 2113.03, offers a survey of the following areas: set theory, mathematical induction, number theory, relations, functions, algebraic structures, and introductory graph theory. The topics to be discussed are fundamental to most areas of Mathematics and have wide applicability to Computer Science.

3 Prerequisites

NS Math 441 or equivalent.

4 Course outcomes

- To understand the structure of logical arguments and mathematical proofs.
- To become familiar with the basic concepts of logic, set theory, number theory, and combinatorics.
- To perform computations in modular arithmetic and to understand the relevant number systems.
- To calculate the number of possible outcomes for problems involving combinations and permutations.
- To prove the correctness of simple recursive algorithms.

5 Course materials

The course has a presence on BrightSpace. The course uses the following publicly available texts.

- *The Book of Proof* by Richard Hammack.
- *Lectures in Discrete Mathematics* by Edward A. Bender and S. Gill Williamson.

Links to the above texts are on BrightSpace. Course notes will occasionally be posted on BrightSpace.

6 Course assessment

6.1 Grading scheme

The grading scheme for the course is given below.

- Assignments: 20%
- Quizzes: $4 \times 4\% = 16\%$
- Midterm: 24%
- Final exam: 40%

The conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale given below.

$A+$	(90-100)	$B+$	(77-79)	$C+$	(65-69)	D	(50-54)
A	(85-89)	B	(73-76)	C	(60-64)	F	(<50)
$A-$	(80-84)	$B-$	(70-72)	$C-$	(55-59)		

6.2 Assignments

Weekly assignments will be posted on BrightSpace and have to be submitted electronically. Please follow the instructions below precisely. Up to 50% of points will be deducted for violations of the format. Points will also be deducted for late submissions and no assignments will be accepted more than 48 hours late. The least assignment mark will be dropped.

- Submit your solutions to the assignment questions in order and start each question on a new page.
- Submit your solutions as a PDF file.
- Submit your solutions before the posted deadline.

6.3 Examinations

Four quizzes will be held in class (on January 22, February 5, March 5, and March 26). Each quiz will be 15 minutes long. The midterm will be held on an evening during the week of February 19. The final examination will last 3 hours. It will be held during the exam period and will be scheduled by the registrar. Textbooks, course notes, and calculators are not permitted during quizzes and exams.

7 Policies and Resources

7.1 Policy on missed examinations

When you miss an exam or quiz, you must let me know via email before the start of the exam/quiz. If you fail to do so, then you will automatically receive a failing grade on the exam/quiz, and there will be no accommodations made. If you did notify me and have a valid excuse, the following applies. If you miss a quiz, your quiz mark will be computed out of the remaining quizzes. If you miss the midterm or final exam, there will be a scheduled make-up exam.

7.2 Further policies and resources

A document containing Dalhousies policies on plagiarism, accessibility, and a number of other important issues has been posted to Brightspace.

8 Course content

The schedule below is subject to change.

Week	Content	Text
8/1 – 12/1	Propositional logic	BoP 2.1-2.5, LDM Lo-1
15/1 – 19/1	Predicate logic	BoP 2.7-2.12, LDM Lo-2
22/1 – 16/1	Inference and proofs	Notes
29/1 – 2/2	Counting	BoP 3
5/2 – 9/2	Counting (continued)	BoP 3
12/2 – 16/2	Number theory	BoP 4-6, LDM NT-1
19/2 – 23/2	Number theory (continued)	BoP 4-6, LDM NT-1
26/2 – 2/3	Induction	BoP 10
5/3 – 9/3	Induction (continued)	BoP 10
12/3 – 16/3	Recursive functions and algorithms	BoP 10 + Notes
19/3 – 23/3	Recursive functions and algorithms (continued)	BoP 10 + Notes
26/3 – 30/3	Equivalence relations and linear congruences	BoP 11
2/4 – 6/4	Fermat's little theorem and applications	Notes
9/4 –10/4	Review	

BoP = Book of Proofs. LDM = Lectures in Discrete Mathematics.