Department of Mathematics and Statistics
MATH/CSCI 2112
(CRN 11699)
Discrete Structures I
Fall 2018

1 General information

Lectures:	MWF 11:35 – 12:25	Studley Chemistry 125
Instructor:	Neil J. Ross	neil.jr.ross@dal.ca
Office hours:	MW 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

- Understand the structure of logical arguments and mathematical proofs.
- Become familiar with the basic concepts of logic, set theory, number theory, and combinatorics.
- Perform computations in modular arithmetic and to understand the relevant number systems.
- Calculate the number of possible outcomes for problems involving combinations and permutations.
- Prove the correctness of simple recursive algorithms.

5 Course materials

The course has a presence on BrightSpace where course notes will be posted. For additional reading, students can use the following publicly available texts (links to these texts are on BrightSpace).

- *The Book of Proof* by Richard Hammack.

- *Lectures in Discrete Mathematics* by Edward A. Bender and S. Gill Williamson.

6 Course assessment

6.1 Assignments

Weekly assignments will be posted on BrightSpace.

6.2 Examinations

There will be two midterms, both lasting 1.5 hours.

- Wednesday October 3rd 2018, 6:30pm – 8:00pm, S E260 (Kenneth Rowe Management Building) room 1028.
- Wednesday November 7th 2018, 6:30pm – 8:00pm, S D420 (Marion McCain Arts and Social Sciences Building) auditorium 2 (Ondaatje Hall).

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 exams.

6.3 Grading scheme

The final grade will be computed as the maximum of the grades obtained from the two schemes below.

	Scheme 1	Scheme 2
Assignements	20%	20%
Midterm 2	20%	0%
Midterm 1	20%	0%
Final	40%	80%

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)		

7 Policies and Resources

7.1 Policy on assignments and exams

Assignments must be handed in at the *beginning* of class on the due date. Late assignments will not be accepted unless a prior arrangement was made. Similarly, missed exams will be given a failing grade unless a prior arrangement was made.

7.2 Learning centres

Two *learning centres* are available to MATH/CSCI 2112 students where teaching assistants can provide help.

- The Mathematics and Statistics Learning Centre

  `https://www.dal.ca/faculty/science/math-stats/about/learning-centre.html`

- The Faculty of Computer Science Learning Centre

  `https://www.dal.ca/faculty/computerscience/about/learningcentre.html`

7.3 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
1 – 7/9	Sets	BoP 1
2 – 14/9	Sets	BoP 1
3 – 21/9	Counting	BoP 3
4 – 28/9	Logic	BoP 2
5 – 5/10	Logic	BoP 2
6 – 12/10	Number theory	BoP 4-6, LDM NT-1
7 – 19/10	Number theory (continued)	BoP 4-6, LDM NT-1
8 – 26/10	Induction	BoP 10
9 – 2/11	Induction (continued)	BoP 10
10 – 9/11	Recursive functions and algorithms	BoP 10 + Notes
11 – 16/11	Recursive functions and algorithms (continued)	BoP 10 + Notes
12 – 23/11	Equivalence relations and linear congruences	BoP 11
13 – 30/11	Fermat's little theorem and applications	Notes
14 – 4/12	Review	

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