

Faculty of Science Course Syllabus
Department of Mathematics and Statistics
MATH/CSCI 2112
Discrete Structures
Summer 2018

Instructor: Iain Beaton ibeaton@dal.ca Chase 311

Lectures: MWF 9:35am-10:25am LSC 238

Office Hours: Monday 10:45-12:00 in the Math Learning Centre (Chase 119) or by appointment.

Course Description

This course together with MATH 2113 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.

Course Prerequisites

Nova Scotia Mathematics 441 or equivalent.

Course Objectives/Learning Outcomes

- To build basic skills in mathematical reasoning.
- To become familiar with the basic terminology and concepts in logic and set theory, combinatorics, and number theory.
- To be able to develop formal proofs (direct, by cases, by contradiction, by contrapositive, and by induction).
- Be able to perform computations in modular arithmetic, and to understand the relevant number system.
- Be able to calculate the number of possible outcomes for problems involving combinations and permutations.
- Be able to prove the correctness of simple recursive algorithms.

Course Materials

- Textbook: The Book of Proof, 2nd Edition by Richard Hammack, available online at <http://www.people.vcu.edu/~rhammack/BookOfProof/>
- Website: Brightspace

Course Assessment

Component	Weight (% of final grade)	Date
<i>Assignments</i>	20%	<i>Weekly (Wednesdays)</i>
<i>Midterm #1</i>	20%	<i>Friday June 1, 2018</i>
<i>Midterm #2</i>	20%	<i>Friday July 13, 2018</i>
<i>Final</i>	40%	<i>(Scheduled by Registrar)</i>

Conversion of numerical grades to Final Letter Grades follows the Dalhousie Common Grade Scale

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)	

Course Policies

- If you miss a midterm or an assignment, a score of 0 will be assigned unless prior arrangements have been made with the instructor or you fill out the Student Self-Declaration of Absence form online in Brightspace. In the case of a missed assignment, the missed assignment score will not be included in the average for that component. For a missed midterm, you must contact the instructor at ibeaton@dal.ca on or before the scheduled date of the midterm, along with your schedule so that a make-up midterm can be scheduled.
- Assignments will be posted on Brightspace on Wednesdays, and will be due the following Wednesday in class.
- You are encouraged to work with others on assignments. However, each student must write out their own assignment. Copying is strictly prohibited.
- Midterms will be held in class on June 1st and July 13th. Each midterm will be 50 minutes long. Nothing but writing utensils and erasers are allowed to be used on exams.

Course Content

This is a tentative schedule for the semester, updated regularly on Brightspace.

Dates	Topics	Chapters (Book of Proof)
May 7-11	Introduction, Sets, Logic	1.1-1.8, 2.1-2.2
May 14-18	Logic (continued)	2.2-2.10
May 21	Victoria Day (No Class)	
May 23-25	Logic (continued), Counting	2.10-2.11, 3.1-3.4
May 28-30	Counting (continued), Direct proof	3.4-3.5, 4.1-4.3
June 1	Midterm #1 (In Class)	
June 4-8	Direct Proof (Continued), Contrapositive Proof	4.4-4.5, 5.1
June 11-15	Contrapositive Proof (Continued), Proof by Contradiction	5.1-5.2, 6.1-6.3
June 18-22	Proving Non-conditional statements	7.1-7.4
June 25-29	Proofs involving sets, Disproof	8.1-8.3, 9.1-9.3
July 2	Canada Day (No Class)	
July 4-6	Induction	10.1-10.2
July 9-11	Induction (Continued), Relations	10.2-10.3, 11.1-11.2
July 13	Midterm #2 (In Class)	
July 16-20	Relations (Continued), Functions	11.2-11.5, 12.1
July 23-27	Functions	12.2-12.6
July 30-Aug 3	Cardinality of Sets	13.1-13.4

Faculty of Science Course Syllabus (Section B)
Discrete Structures – Math/CSCI 2112

University Policies and Statements

This course is governed by the academic rules and regulations set forth in the University Calendar and by Senate

Academic Integrity

At Dalhousie University, we are guided in all of our work by the values of academic integrity: honesty, trust, fairness, responsibility and respect (The Center for Academic Integrity, Duke University, 1999). As a student, you are required to demonstrate these values in all of the work you do. The University provides policies and procedures that every member of the university community is required to follow to ensure academic integrity.

Information: https://www.dal.ca/dept/university_secretariat/academic-integrity.html

Accessibility

The Advising and Access Services Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students who request accommodation as a result of a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (Canada and Nova Scotia).

Information: https://www.dal.ca/campus_life/academic-support/accessibility.html

Student Code of Conduct

Everyone at Dalhousie is expected to treat others with dignity and respect. The Code of Student Conduct allows Dalhousie to take disciplinary action if students don't follow this community expectation. When appropriate, violations of the code can be resolved in a reasonable and informal manner—perhaps through a restorative justice process. If an informal resolution can't be reached, or would be inappropriate, procedures exist for formal dispute resolution.

Code: https://www.dal.ca/dept/university_secretariat/policies/student-life/code-of-student-conduct.html

Diversity and Inclusion – Culture of Respect

Every person at Dalhousie has a right to be respected and safe. We believe inclusiveness is fundamental to education. We stand for equality. Dalhousie is strengthened in our diversity. We are a respectful and inclusive community. We are committed to being a place where everyone feels welcome and supported, which is why our Strategic Direction prioritizes fostering a culture of diversity and inclusiveness

Statement: <http://www.dal.ca/cultureofrespect.html>

Recognition of Mi'kmaq Territory

Dalhousie University would like to acknowledge that the University is on Traditional Mi'kmaq Territory. The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit or e-mail the Indigenous Student Centre (1321 Edward St) (elders@dal.ca).

Information: https://www.dal.ca/campus_life/communities/indigenous.html

Important Dates in the Academic Year (including add/drop dates)

https://www.dal.ca/academics/important_dates.html

University Grading Practices

https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html

Missed or Late Academic Requirements due to Student Absence (policy)

https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html

Student Resources and Support

Advising

General Advising https://www.dal.ca/campus_life/academic-support/advising.html

Science Program Advisors: <https://www.dal.ca/faculty/science/current-students/academic-advising.html>

Indigenous Student Centre: https://www.dal.ca/campus_life/communities/indigenous.html

Black Students Advising Centre: https://www.dal.ca/campus_life/communities/black-student-advising.html

International Centre: https://www.dal.ca/campus_life/international-centre/current-students.html

Academic supports

Library: <https://libraries.dal.ca/>

Writing Centre: https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html

Studying for Success: https://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html

Copyright Office: <https://libraries.dal.ca/services/copyright-office.html>

Fair Dealing Guidelines <https://libraries.dal.ca/services/copyright-office/fair-dealing.html>

Other supports and services

Student Health & Wellness Centre: https://www.dal.ca/campus_life/health-and-wellness/services-support/student-health-and-wellness.html

Student Advocacy: <https://dsu.ca/dsas>

Ombudsperson: https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html

Safety

Biosafety: <https://www.dal.ca/dept/safety/programs-services/biosafety.html>

Chemical Safety: <https://www.dal.ca/dept/safety/programs-services/chemical-safety.html>

Radiation Safety: <https://www.dal.ca/dept/safety/programs-services/radiation-safety.html>

Scent-Free Program: <https://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>