

**Dalhousie University**  
**Faculty of Science**  
**MATH/CSCI 2112—Discrete Structures I**  
**Fall 2020**  
**Asynchronous Online Class**

## **SECTION A: COURSE INFORMATION**

**Instructor:** Maryam Ehya (She/Her) **Email:** [mr390045@dal.ca](mailto:mr390045@dal.ca)

**TA:** Kyle MacKeigan

**Class Time:** MWF, 13:35-14:25

**Office Hours:** Via Collaborate Ultra, time TBD based on the survey

### **Course Delivery Information**

This is an online course delivered asynchronously. The course material will be posted gradually on Brightspace according to the class official schedule (MWF 13:35-14:25). All assignments, quizzes and the final exam will be available and submitted through Brightspace.

### **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 Pre-requisites**

Nova Scotia Mathematics 441 or equivalent.

### **Course Learning Outcomes**

Upon completion of this course, students should be able to:

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

### **Course Materials**

1. "The Book of Proof", Richard Hammack, available at:  
<https://www.people.vcu.edu/~rhammack/BookOfProof/>
2. "Lectures in Discrete Mathematics", Edward A. Bender and S. Gill Williamson, available at:  
<https://cseweb.ucsd.edu/~gill/BWLectSite/>
3. All other material, including but not limited to, pre-recorded lectures, lecture notes and slides are accessible through Brightspace.

## Course Schedule

Week/Module Class Dates	Focus Topic (rough sketch)	Activities
Week 1 (Sep 8-13)	Set Theory	Completing the Survey
Week 2 (Sep 14-20)	Set Theory/Counting	
Week 3 (Sep 21-27)	Counting	
Week 4 (Sep 28-Oct 4)	Logic	Assignment 1 due on Oct 2
<b>Oct 2</b>	-----	<b>last day to drop a course without a “W”</b>
Week 5 (Oct 5-11)	Logic/Proofs	
Week 6 (Oct 12-18)	Proofs	Assignment 2 due on Oct 16
<b>Oct 12</b>	-----	<b>Thanksgiving-University Closed</b>
Week 7 (Oct 19-25)	Number Theory	
Week 8 (Oct 26-Nov 1)	Number Theory	Assignment 3 due on Oct 30
Week 9 (Nov 2-8)	Induction	
<b>Nov 2</b>	-----	<b>last day to drop a course with a “W”</b>
<b>Nov 9-13</b>	-----	<b>Fall Study Break, No Class</b>
Week 10 (Nov 16-22)	Relations & Functions	Assignment 4 due on Nov 20
Week 11 (Nov 23-29)	Equivalence relations	
Week 12 (Nov 30-Dec 6)	Recursive Functions	Assignment 5 due on Dec 4
Week 13 (Dec 7-8)	Exam Review	

## Course Assessments

Assessment	Frequency	Weight
Five Written Assignments	Biweekly	50%
Weekly Quizzes	Weekly	15%
Participation	Weekly	10%
Final Exam	Scheduled By Registrar Office	25%

1. Assignments will be available on the course Brightspace one week prior to their due dates. The due date will be as indicated in the above table at 11:59 pm. The late assignments are accepted within 48 hours of the due date. A 15% deduction (from the total weight of the assignment) will be applied as a penalty.
2. Each weekly quiz tests the material of its corresponding week. Only one attempt is granted for each quiz. The students must complete the attempt on the quiz to release the content of the next week.
3. Participation will be recorded by Panopto quizzes, provided in between the Lecture videos. They might be content related or not. If a student complete an attempt on these quizzes, they will get their point regardless of the accuracy of the answer. The week's Panopto quizzes will be closed by Sunday of that week, at 11:59 pm.
4. The final exam will be scheduled by registrar office. It is up to the discretion of the instructor to use remote proctoring in online testing. Students may be required to download proctoring software onto their devices. Students who cannot meet system requirements for remote proctoring should contact the instructor for an alternate assessment. (Typical system requirements are: (i) Mac OS or Windows, (ii) a web-cam, and (iii) an internet connection.)

### Where to Get Academic Help

1. Office Hours through Collaborate Ultra (link is provided in Brightspace)
2. Discussion Boards in Brightspace
3. Math and Stat Virtual Learning Center through Collaborate Ultra (link is provided in Brightspace)

### How to Contact the Instructor Directly

1. **The instructor's office hours:** Office hours will be held via collaborate ultra. The timing will be determined based on the survey.
2. **Email:** You may email the instructor if you have a concern, question or request that is not directly related to the course material. All course material related issues must be perused via office hours or discussion boards. You will receive a response within 24 hours during working days. Please include 2112 in the email's subject.
3. **Anonymous Board:** You have the choice to be anonymous or not in this discussion board space. Your message is not public and only the moderator can see it unless the moderator publishes it. The anonymous discussion board will be checked twice a week and an appropriate response will be provided if it is needed.

### Course Policies

- 1) Missed assignment will be counted as zero. Exceptions are made for medical reasons.
- 2) If a student misses an assignment due to a medical reason, they must inform the instructor via email at least an hour prior to the due date and a 72 hour extension will be granted without penalty. The student must submit a Student Declaration of Absence form with their assignment. This is not an option for a late assignment.  
The Student Declaration of Absence can be used only twice during the course. Consult the following link for more information on the Student Declaration of Absence.  
[https://www.dal.ca/dept/university\\_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html](https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html)
- 3) It will not be possible to write the final exam early. There will only be a make-up of the final exam in case of illness or family emergencies. The instructor must be informed of your absence at least an hour prior the exam is available. A Student Declaration of Absence form must be submitted in medical cases.
- 4) Office hours will be held on Collaborate Ultra found in BrightSpace.
- 5) All questions regarding this course content, assignments or tests must be asked on the BrightSpace discussions threads. Please read all previously asked questions before you post. The questions will be answered within 24 hours during the week days.
- 6) You may contact the instructor via email to request an appointment, inform her of your absence and obtain an extension on the assignment or other personal matters.
- 7) The students are strongly advised to educate themselves about Brightspace.
- 8) Academic integrity is very important. Plagiarism and cheating will not be tolerated. Please study the following webpage to learn more about plagiarism to avoid his serious offence.  
[https://www.dal.ca/dept/university\\_secretariat/academic-integrity/plagiarism-cheating.html](https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating.html)  
Plagiarism is only one type of academic dishonesty. The Academic Calendar also identifies other types of cheating including: [https://www.dal.ca/dept/university\\_secretariat/academic-integrity/plagiarism-cheating/other-cheating.html](https://www.dal.ca/dept/university_secretariat/academic-integrity/plagiarism-cheating/other-cheating.html)

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

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

**Important Dates:**

[https://www.dal.ca/academics/important\\_dates.html](https://www.dal.ca/academics/important_dates.html)

September 7	Labour Day – University Closed
September 8	Classes begin
September 18	Last day to register Last day to add or drop fall term courses without financial implications Last day for a complete refund for students
October 2	Last day to change fall terms from audit to credit (and vice versa) Last day to drop a fall term course without a “W”
October 12	Thanksgiving Day – University Closed
November 2	Last day to drop fall term classes with a “W”
November 9-13	Fall Study Break – no classes, but University open
November 11	Remembrance Day – University Closed
December 8	Classes end (While Tuesday, December 8, Monday classes will be held)
December 10-20	Exam Period
December 30	Grades due
December 25-31	University Closed

## SECTION B: UNIVERSITY POLICIES, STATEMENTS, GUIDELINES and RESOURCES for SUPPORT

This course is governed by the academic rules and regulations set forth in the University Calendar and the Senate. <https://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog>

### University Statements

- **Territorial Acknowledgement:**

Dalhousie University is located in Mi'kma'ki, the ancestral and unceded territory of the Mi'kmaq. We are all Treaty people.<sup>1</sup>

- **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. 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. (Read more: [http://www.dal.ca/dept/university\\_secretariat/academic-integrity.html](http://www.dal.ca/dept/university_secretariat/academic-integrity.html))

- **Accessibility**

The Student Accessibility Centre is Dalhousie's centre of expertise for student accessibility and accommodation. The advising team works with students on the Halifax campus who request accommodation as a result of: a disability, religious obligation, or any barrier related to any other characteristic protected under Human Rights legislation (NS, NB, PEI, NFLD).

If there are aspects of the design, instruction, and/or experiences within this course that result in barriers to your inclusion please contact:

- the Student Accessibility Centre ([https://www.dal.ca/campus\\_life/academic-support/accessibility.html](https://www.dal.ca/campus_life/academic-support/accessibility.html)) for all courses offered by Dalhousie with the exception of Truro.
- the Student Success Centre in Truro for courses offered by the Faculty of Agriculture (<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre.html>)

Please note that your classroom may contain accessible furniture and equipment. It is important that these items remain in the classroom, undisturbed, so that students who require their use will be able to fully participate.

- **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. (Read more: [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/student-life-policies/code-of-student-conduct.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/student-life-policies/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. Dalhousie is strengthened in our diversity and dedicated to achieving equity. We are committed to

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<sup>1</sup> For more information about the purpose of territorial acknowledgements, or information about alternative territorial acknowledgements if your class is offered outside of Nova Scotia, please visit <https://native-land.ca/>.

being a respectful and inclusive community where everyone feels welcome and supported, which is why our university prioritizes fostering a culture of diversity and inclusiveness.

(Read more: <https://www.dal.ca/cultureofrespect.html>)

What we all need to do:

1. **Be Ready to Act:** This starts with promising yourself to speak up to help prevent it from happening again. Whatever it takes, summon your courage to address the issue. Try to approach the issue with open-ended questions like “Why did you say that?” or “How did you develop that belief?”
2. **Identify the Behaviour:** Use reflective listening and avoid labeling, name-calling, or assigning blame to the person. Focus the conversation on the behaviour, not on the person. For example, “The comment you just made sounded racist, is that what you intended?” is a better approach than “You’re a racist if you make comments like that.”
3. **Appeal to Principles:** This can work well if the person is known to you, like a friend, sibling, or co-worker. For example, “I have always thought of you as a fair-minded person, so it shocks me when I hear you say something like that.”
4. **Set Limits:** You cannot control another person’s actions, but you can control what happens in your space. Do not be afraid to ask someone “Please do not tell racist jokes in my presence anymore” or state “This classroom is not a place where I allow homophobia to occur.” After you have set that expectation, make sure you consistently maintain it.
5. **Find or be an Ally:** Seek out like-minded people that support your views, and help support others in their challenges. Leading by example can be a powerful way to inspire others to do the same.
6. **Be Vigilant:** Change can happen slowly, but do not let this deter you. Stay prepared, keep speaking up, and do not let yourself be silenced.

- [Fair Dealing policy](#)

The Dalhousie University Fair Dealing Policy provides guidance for the limited use of copyright protected material without the risk of infringement and without having to seek the permission of copyright owners. It is intended to provide a balance between the rights of creators and the rights of users at Dalhousie.

(Read more: [https://www.dal.ca/dept/university\\_secretariat/policies/academic/fair-dealing-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/fair-dealing-policy.html) )

### University Policies and Programs

- Important Dates in the Academic Year (including add/drop dates)  
[http://www.dal.ca/academics/important\\_dates.html](http://www.dal.ca/academics/important_dates.html)
- Dalhousie Grading Practices Policy  
[https://www.dal.ca/dept/university\\_secretariat/policies/academic/grading-practices-policy.html](https://www.dal.ca/dept/university_secretariat/policies/academic/grading-practices-policy.html)
- Grade Appeal Process  
[https://www.dal.ca/campus\\_life/academic-support/grades-and-student-records/appealing-a-grade.html](https://www.dal.ca/campus_life/academic-support/grades-and-student-records/appealing-a-grade.html)
- Sexualized Violence Policy  
[https://www.dal.ca/dept/university\\_secretariat/policies/health-and-safety/sexualized-violence-policy.html](https://www.dal.ca/dept/university_secretariat/policies/health-and-safety/sexualized-violence-policy.html)
- Scent-Free Program  
<http://www.dal.ca/dept/safety/programs-services/occupational-safety/scent-free.html>

### Learning and Support Resources

- General Academic Support – Advising  
[https://www.dal.ca/campus\\_life/academic-support/advising.html](https://www.dal.ca/campus_life/academic-support/advising.html) (Halifax)  
<https://www.dal.ca/about-dal/agricultural-campus/student-success-centre/academic->

[support/advisingdalac.html](https://www.dal.ca/support/advisingdalac.html) (Truro)

### Some Useful Links

- Student Health & Wellness Centre: [https://www.dal.ca/campus\\_life/health-and-wellness.html](https://www.dal.ca/campus_life/health-and-wellness.html)
- On Track (helps you transition into university, and supports you through your first year at Dalhousie and beyond) [https://www.dal.ca/campus\\_life/academic-support/On-track.html](https://www.dal.ca/campus_life/academic-support/On-track.html)
- Indigenous Student Centre [https://www.dal.ca/campus\\_life/communities/indigenous.html](https://www.dal.ca/campus_life/communities/indigenous.html)
- Elders-in-Residence (The Elders in Residence program provides students with access to First Nations elders for guidance, counsel and support. Visit the office in the Indigenous Student Centre or contact the program at [elders@dal.ca](mailto:elders@dal.ca) or 902-494-6803.)
- <https://www.dal.ca/academics/programs/undergraduate/indigenous-studies/a-day-in-the-life/elders-in-residence.html>
- Black Student Advising Centre [https://www.dal.ca/campus\\_life/communities/black-student-advising.html](https://www.dal.ca/campus_life/communities/black-student-advising.html)
- International Centre [http://www.dal.ca/campus\\_life/student\\_services/international-centre.html](http://www.dal.ca/campus_life/student_services/international-centre.html)
- South House Sexual and Gender Resource Centre <https://southhousehalifax.ca/about/>
- LGBTQ2SIA+ Collaborative - <https://www.dal.ca/dept/hres/education-campaigns/LGBTQ2SIA-collaborative.html>
- Dalhousie Libraries <http://libraries.dal.ca>
- Copyright Office <https://libraries.dal.ca/services/copyright-office.html>
- Dalhousie Student Advocacy Services <http://dsu.ca/dsas>
- Dalhousie Ombudsperson [https://www.dal.ca/campus\\_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html](https://www.dal.ca/campus_life/safety-respect/student-rights-and-responsibilities/where-to-get-help/ombudsperson.html)
- Human Rights and Equity Services <https://www.dal.ca/dept/hres.html>
- Writing Centre [https://www.dal.ca/campus\\_life/academic-support/writing-and-study-skills.html](https://www.dal.ca/campus_life/academic-support/writing-and-study-skills.html)
- Study Skills/Tutoring
- [http://www.dal.ca/campus\\_life/academic-support/study-skills-and-tutoring.html](http://www.dal.ca/campus_life/academic-support/study-skills-and-tutoring.html)
- Faculty or Departmental Advising Support (Note: there is a different link for each faculty, and possibly for different departments or programs)