Faculty of Science Course Syllabus (Part A)
Math 2051, Problems in Geometry
Winter 2021

Instructor: Dr. Martin Szyld

Email: mszyld@dal.ca

Lectures: MWF 11:35am - 12:25pm on Collaborate Ultra.
Link: https://ca.bbcollab.com/guest/94e3364b8dcc464f9fef999bdeabb9bf

Office hours: M 1.30pm-2.30pm F 1pm-2pm on Collaborate Ultra.
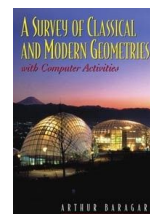Link: https://ca.bbcollab.com/guest/94e3364b8dcc464f9fef999bdeabb9bf

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Course Prerequisites
Math 1010.

Course Materials
- *Textbook: A Survey of Classical and Modern Geometries with Computer Activities by Arthur Baragar, Prentice Hall, 2001. ISBN 0-13-014318-9*
- *Course website on Brightspace is accessed through dal.brightspace.com*

Course Description
Our main object of study in this course is the geometry of the Euclidean plane. We will consider its axiomatization, and several classical constructions and results. Euclidean geometry is a breeding ground for lots of good problems of varying difficulty, we will present some of these as theorems in class and others will be handed as assignments. Depending on available time and audience interests, we may also explore other related topics such as a deeper study of isometries, constructibility, finite geometries, and non-euclidean geometries.

Course Content
We will cover the following chapters from the book: Chapter 1 (Euclidean Geometry), Chapter 3 (Constructions Using a Compass and Straightedge), and parts of Chapter 4 (Geometer's Sketchpad**). Depending on available time and audience interests, we may continue with Chapter 6 (Hyperbolic Geometry) and Chapter 7 (up to Section 7.13).

**Instead of Geometer's Sketchpad, we will use the software package Cinderella for constructions. There is a free version of this package available online, at www.cinderella.de, which should be sufficient for the course.

Course Objectives/Learning Outcomes
The focus of the course will be set not only on its content as described above, but also on the following objectives:
- *Appreciating proofs in mathematics and the axiomatic method (understanding what's an axiomatization and what constitutes a mathematical proof, knowing some of them, learning how to "show" statements).*

- *Recognizing the significance (both historic and mathematical) of Euclid's fifth axiom and the "role of the infinity" in it, as well as informally understanding what a model for a geometry consists of.*

After taking this course, a student is expected to have become familiar with Euclidean geometry, to have learned strategies for solving mathematical problems, and to be able to write his or her solutions with a certain degree of formality.

Course Assessment

Participation	*5%*	*Participation in class and discussion boards.*
Homework	*30%*	*Assigned throughout the semester, to be handed in on Brightspace.*
Module tests 1-3	*45%*	*Wednesdays Feb 3, Mar 3, Mar 24.*
Final Exam	*20%*	*Scheduled by the Registrar's Office.*

Conversion of numerical grades to Final Letter Grades follows the <u>Dalhousie Common Grade Scale</u>

A+ [90-100]	**B+** [77-80)	**C+** [65-70)	**D** [50-55)
A [85-90)	**B** [73-77)	**C** [60-65)	**F** [0-50)
A- [80-85)	**B-** [70-73)	**C-** [55-60)	

Course Policies

1. Homework: You **are permitted** to work collaboratively with other students in this class on homework. I have created some virtual study spaces on Brightspace where you can meet and work. Regardless of whom you work with, each student must complete their own individual homework. Homework must be written in your own words. You are **not permitted** to copy answers from the internet or to ask anybody on the internet for help with your homework. The only exception to this is the Math Learning Centre, which is currently running virtually through Collaborate Ultra.

2. Module tests and final exam: You are **not permitted** to talk to any person other than me, Martin Szyld, about any aspect of a module test or final exam. You are **not permitted** to look up answers on the internet or to ask anybody on the internet for help with your module tests or final exam. During the exams, you **will be permitted** to consult a certain amount of material, and this will be made precise closer to the exam date.

<u>Technical problems</u>: Don't leave submission until the last minute. Extra time will be incorporated in the time-windows of exams, to allow for routine technical hassles involved with online submission. You will have approximately a week for each homework assignment and are expected to submit your work well before the last minute. Only students who can demonstrate that major technical malfunctions or other circumstances beyond their control prevented their submission of a test will be extended a grace period or given a make-up paper at another time.

3. We will use plagiarism software and other technological means to detect academic integrity issues.
4. Late homework will not be accepted except with the instructor's prior permission.
5. A missed module test cannot be written at another time. If you miss a module test without prior permission, then it will count as a 0. Exceptions are made in two cases: (1) if you obtain the instructor's prior permission to miss a test, or (2) if you submit a Student Declaration of Absence form prior to the test. In these cases, the weight of the missed test will be shifted to the final exam (e.g., the final exam will then count 35% instead of 20%). There is no make-up option for the final exam except in cases of an officially valid excuse such as illness, with a Student Declaration of Absence form.
6. 5% of your grade are for participation. There are at least three ways to participate: you can ask or answer a question in class; you can ask or answer a question in office hours; or you can ask or answer a question in

the Brightspace discussion forum. Each time you do so, you receive 1 participation point, up to a maximum of 5 points. 5 points equals 5%. I reserve the right to not award points in case of frivolous activity (e.g.: don't ask what is 1+1; don't ask questions you already know the answer to; don't answer your own question just to get a point; don't conspire to answer a friend's question just to get a point, etc. The point is *participation*).

7. You are welcome to email me with questions or issues that are private or personal to you, or in case you should have any questions during a module test or exam. When asking math-related questions in the normal course of things, please use the discussion forum on Brightspace. This way, you can get participation points, and others can benefit from seeing your question and any answers that are already there. You are welcome and encouraged to answer each other's questions and be helpful, but obviously don't just post the answers to the homework in the discussion forum.

8. Lectures will be given live, and will be recorded. You are not strictly required to attend the live lectures, but I encourage you to do so. Experience shows that students who come to lectures tend to learn more and do better.

Faculty of Science Course Syllabus (Part B)
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University Policies and Statements

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

Missed or Late Academic Requirements due to Student Absence

As per Senate decision instructors <u>may not require medical notes</u> of students who must miss an academic requirement**, including the final exam**, for courses offered during fall or winter 2020-21 (until April 30, 2021). Information on regular policy, including the use of the Student Declaration of Absence can be found here: **https://www.dal.ca/dept/university_secretariat/policies/academic/missed-or-late-academic-requirements-due-to-student-absence.html.**

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

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