

Faculty of Science Course Syllabus
Department of Physics and Atmospheric Science
PHYC 4411 (PHYC 5411, OCEA 4411, OCEA 5411)
Atmospheric Dynamics I
Fall 2022

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

We acknowledge the histories, contributions, and legacies of the African Nova Scotian people and communities who have been here for over 400 years.

Instructor(s):	Manuel Helbig	manuel.helbig@dal.ca
Office Hours:	Please email me to arrange an appointment on Teams or in-person	
Lectures:	Tues and Thurs 2:35pm to 3:55pm in Dunn 221C starting Sept 6, 2022	
Laboratories:	None	
Tutorials:	None	
Course delivery:	In-person (lectures can be recorded upon individual requests)	

Course Description

The basic laws of fluid dynamics are applied to studies of atmospheric motion, including the atmospheric boundary layer and synoptic scale weather disturbances (the familiar highs and lows on weather maps). Emphasis will be placed on the blend of mathematical theory and physical reasoning which leads to the best understanding of the dominant physical mechanisms.

Course Prerequisites

PHYC 2140.03 or permission of the instructor

Ability to integrate simple differential equations and basic understanding of vector calculus

Learning Objectives

Basic understanding of tropospheric dynamics

Ability to interpret weather map features (highs, lows, isobars)

Course Materials

- Lecture slides (uploaded to Brightspace)
- Textbook (not mandatory):
 - o J.E. Martin: Mid-Latitude Atmospheric Dynamics: A First Course. ISBN: 978-0-470-86465-4.

Course Assessment

Assessment	Weight (% of final grade)	Date
<i>Participation</i>	<i>5%</i>	-
<i>Assignments</i>	<i>4 x 10%</i>	<i>Due Sep 22, Oct 13, Nov 3, Nov 24</i>
<i>Test</i>	<i>20%</i>	<i>Oct 27</i>
<i>Final exam</i>	<i>35%</i>	<i>Scheduled by Registrar</i>

Participation

Students are strongly encouraged to ask questions and participate in class discussions. A student's level of engagement throughout the term will be reflected in their participation grade, comprising a maximum of 5 points toward their total mark.

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 on Missed or Late Academic Requirements

Late Assignments will lose 10% of value per day.

Students do not need to use the Absence Form.

All assignments, test, and exam must be completed. If students must miss a requirement, they will be offered a make-up exam or alternate assignment

Course Policies related to Academic Integrity

Students are welcome to discuss assignments but are not permitted to share written material. No collaboration is accepted for test and exam.

Plagiarism software will not be used in this course.

Course Content

Part I deals mostly with establishing basic principles and deriving the governing equations, whereas Part II focuses on applications, including weather.

Lecture topics

Review of mathematical tools

Fundamental and apparent forces explaining the behavior of the fluid atmosphere

Mass, momentum, and energy

Applications of the equations of motion

**Faculty of Science Course Syllabus (Section B)
Fall/Winter 2022-23**

PHYC 4411 (PHYC 5411, OCEA 4411, OCEA 5411)

Please ensure that the following information on University Policies is available to all students in your course. This document should be sent to students in your course along with your Course Syllabus, Section A, or may be copied into your **Course Syllabus (Section A)**.

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://academiccalendar.dal.ca/Catalog/ViewCatalog.aspx?pageid=viewcatalog&catalogid=117&chapterid=-1&topicgroupid=31821&loaduseredits=False>

University Grading Practices

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