

Faculty of Science Course Syllabus (Section A)
Department of Physics and Atmospheric Science
PHYC 4505
Atmospheric Physics
Winter 2022

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

Instructor(s): Ian Folkins, ian.folkins@dal.ca, Office Hours by personal arrangement

Lectures: MWF 1:35 - 2:25

Laboratories: Not applicable

Tutorials: Held on demand before tests and quizzes

Course delivery: In-person

Course Description

Moist thermodynamics is applied to a variety of atmospheric phenomenon. These include aerosols, cloud droplets, precipitation formation, convection, supercells, hurricanes, lightning, and the boundary layer. We also discuss the radar equation and the interpretation of radar images.

Course Prerequisites

PHYC 2140 and PHYC 4520, or permission of the instructor

Course Exclusion

None

Learning Objectives

- (1) Conceptual Understanding of warm rain process
- (2) Mathematically calculate evaporation of falling rain
- (3) Calculate mixing of moist air parcels
- (4) Factors determining hurricane formation
- (5) Understand Cloud droplet nucleation
- (6) Understand origin of boundary layer turbulence
- (7) Understand factors which affect convective instability
- (8) Understand Origin of lightning

Course Materials

Atmospheric Science. An Introductory Survey, Wallace and Hobbs

Course web page: <https://www.mathstat.dal.ca/~folkins/phys.html> will be used to post assignments, quiz dates, etc.



Course Assessment

Component	Weight (% of final grade)	Date ¹
Assignments ²	20%	weekly
Tests/quizzes ³	30%	(50 min) Early Feb, early March, early April.
Final exam ^{3,4}	50%	Exam Period (date from class discussion)

Other course requirements

Not applicable

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, quizzes, and exam must be completed. There is no way to make up uncompleted course requirements, or employ alternate evaluation schemes.

Course Policies related to Academic Integrity

Students are welcome to discuss assignments but are not permitted to share written material.

Course Content

The first third of the course will be on aerosol, cloud, and precipitation physics and moist thermodynamics. The second third will be on convection, lightning, and hurricanes. The final third will be on the boundary layer, and surface fluxes.