

ATOC 214 – 001 Introduction: Physics of the Atmosphere

Course Outline, Fall 2020

Department of Atmospheric & Oceanic Sciences, McGill University

Lectures / online class schedule

When: September 2 – December 3, 2020
Monday, Wednesday & Friday, 10:35 – 11:25 h Eastern time (EST/EDT)

Notes: Monday, September 7 and Monday, October 12 are [legal holidays](#) – no class;
Thursday, December 3 is a make-up lecture day following a Monday schedule

Where: online classes (remotely via Zoom, myCourses; see description below)

Course credit: 3 credit points

Instructor

Prof. Andreas Zuend

Office: Burnside Hall, room 809
Phone: 514-398-7420 (office)
Email: andreas.zuend@mcgill.ca
Office hours: Contact me by using one of the following options:
1) if appropriate, consider using the '[Discussions](#)' tool on [myCourses](#) to ask course-related questions and get responses from TAs / Prof. / other students;
2) for other inquiries send me an email or Microsoft “Teams” chat message with your question (I usually respond within 24 hours);
3) send me an email to schedule an appointment for a one-to-one or group video call.

Teaching assistants

To be announced

Office: [Burnside Hall, room xyz]
Email: [tbd]
Office Hours: details to be added... (or by email appointment)

To be announced

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Course contents

A survey of the Earth's atmosphere, weather and the climate system with a focus on physical meteorology. Topics include the fundamental processes that determine interactions between the atmosphere, ocean and biosphere. Lectures will cover the contents of Chapter 1 – 7 of the textbook (*Meteorology Today*), supplemented by additional quantitative material and discussions of physical principles. The topics include the chemical composition and structure of the atmosphere, physical

parameters and processes, such as energy balance, the greenhouse effect, heat transfer within the Earth system compartments, air temperature, pressure, and humidity, condensation and cloud formation, precipitation processes and the discussion of how the fundamental processes affect day-to-day weather, climate, and air quality.

Textbook

Meteorology Today: An Introduction to Weather, Climate, and the Environment

(1st or 2nd Canadian edition) by Ahrens, Jackson, and Jackson,

ISBN13: 978-0-17-653079-2 (available at the McGill bookstore) other recent US editions (9th or newer) are also acceptable, some available as ebook: <https://www.nelsonbrain.com/shop/isbn/9781337677622>.

This book is recommended but not mandatory for this course. Relevant information from the selected chapters will also be provided on the lecture slides and/or related handouts.

Mode of course content delivery

Given the current situation caused by the Covid-19 crisis, this course, including regular lectures, homework and assessments, will be delivered in the form of online activities, self-study, and homework assignments.

- Instead of physical classroom meetings, the classes will take place regularly in the form of interactive ~50 min Zoom (video) calls three times a week (see schedule above; some holiday exceptions).
- These Zoom meetings will be accessible via the Zoom tool linked on the myCourses website and/or shared call links.
- The course ‘lecture’ content will be delivered by means of one of two modes depending on the chapter / topic:
 - Mode 1: (most classes) live Zoom lectures using both shared slides of course material, live presentation using the Zoom whiteboard, interactive discussions by means of the Zoom chat, and participation in live multiple-choice polls and related discussions.
 - Mode 2: reading assignments (provided lecture slides, book sections), some accompanied by pre-recorded short lectures, to be completed prior to class time. The class time on Zoom will be used to recap key concepts of the studied material, to answer questions and to solve related examples together on the whiteboard or in small groups.
- Lecture slides will be made available prior to each meeting.
- Active participation in the Zoom meetings is highly recommended (but not mandatory).
- The live Zoom meetings will be recorded and saved on myCourses for future access to all students enrolled in this course.
- Students will have the option to participate in the Zoom discussions with or without their video shown, depending on personal preference, internet bandwidth etc. Details about use of Zoom by participants and key tools on myCourses will be introduced in the first online meeting.

Website / myCourses

All relevant materials (announcements, lecture slides, assignments, etc.) will be posted on the myCourses page for ATOC 214. Assignments will be handed in / uploaded in electronic format (detailed instructions to do so will be provided).

Prerequisites

CEGEP Physics, or the combination of PHYS 131 – Mechanics and Waves and PHYS 142 – Electromagnetism and Optics; or permission of the instructor.

Assessments & Evaluation

	<i>weight</i>
Homework assignments:	30 %
Midterm exams: (two 30-min, timed online quizzes; Oct. 19 & Nov. 02)	30 %
Final exam: (3 h open-book exam, during exam period)	40 %

- There will be **4 homework assignments**. Please submit these *online on the due date* as indicated on the assignments. These assignments are a mandatory part of the course.
Note: In accordance with McGill Academic regulation 27, in the absence of a medical certificate or analogous circumstances, any required assignment submitted after its due date and time shall be assessed a penalty of one grading unit per day late (including weekend days).
- The **two midterm exams** will be in the form of two time-limited, 30-minute online quizzes. The first midterm will focus on multiple choice questions while the second midterm will focus on short-answer and calculation problems. These short exams contribute each 15 % to the overall course grade. These quizzes will need to be completed within 24 h of the indicated dates; a portion of the regular class time will be reserve for their completion.
- Details on covered material for exams, allowed formula sheets, notes and tools will be announced in advance of the exams.
- The **3 h final exam** will consist of a combination of multiple choice, short-answer questions and calculation problems. It will be in the form of a take-home, open-book exam during the final exam period. The final exam will cover material from the entire course.
- If a student is not able to complete an assignment or exam within the given time frame due to a valid, documented reason (e.g. illness), the instructor should be informed as soon as possible, such that an extension, exam deferral, or another adequate measure can be considered ([student assessment policy](#)).
- Unless otherwise specified, no work intended for extra credit will be accepted.
- In the case of a failing grade, there will be a supplemental exam offered during the supplemental exam period worth 100 % of the course grade. See further information on [eligibility rules for deferred and supplemental exams](#).

General rules and regulations

- McGill University values academic integrity. Therefore, **all students must understand the meaning and consequences of cheating, plagiarism and other academic offences** under the Code of Student Conduct and Disciplinary Procedures (see this webpage for more information: www.mcgill.ca/students/srr/honest/).
- **On plagiarism**, citing the student assessment policy: When the University has reasonable cause to suspect that a Student has represented the work of another person as his or her own, the University may take any reasonable means to verify the originality of the work including the use of text-matching software in accordance with the Policy on Text-Matching.

- In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course may be subject to change.
- In accordance with McGill University's Charter of Students' Rights, students in this course have the right to submit any written work that is to be graded in English or in French.
- In accordance with McGill Academic regulation 27, in the absence of a medical certificate or analogous circumstances, any required assignment submitted after its due date and time shall be assessed a penalty of one grading unit per day late (including weekend days).
- If you have a disability, please contact the instructor to arrange a time to discuss your situation. It would be helpful if you contact the Office for Students with Disabilities at 514-398-6009 before you do this.