

DEPARTMENT OF ENVIRONMENT & GEOGRAPHY – COURSE OUTLINE

GEOG 2300 A01 Atmospheric Thermodynamics, Clouds and Precipitation (Fall 2015) (3-Credit Hours)

Instructor:

Name: Dr. John Hanesiak and Dr. Ronald Stewart
Email: john.hanesiak@umanitoba.ca and ronald.stewart@umanitoba.ca
Lectures: T/Th at 11:30 AM - 12:45 PM in Room 315 Wallace Bldg.
Office Hours: by appointment

Textbook (required):

Stull, R. B., Meteorology for Scientists and Engineers. 2nd ed. Pacific Grove, CA: Brooks/Cole, c2000.

Tools:

All students should ensure they have non-programmable scientific calculators.

References:

Tsonis, A.A., *An introduction to atmospheric thermodynamics*, 2nd ed. Cambridge University Press, 2007.
Rogers, R.R. and M.K. Yau, *A short course in cloud physics*, 3rd ed., Butterworth-Heinemann, 1996.
Salby, Murray L., *Fundamentals of atmospheric physics*, Academic Press, 1996.
Jacobson, Mark Z., *Fundamentals of atmospheric modeling*, University Press, 1999.
Robinson, P.J. and A. Henderson-Sellers, *Contemporary Climatology*, 2nd Ed., Longman, 1999.

Course Description and Objectives

The science of meteorology is founded upon the observation, description, and explanation of the physical properties of the Earth's atmosphere. The goal of this science is to explain and predict the weather and various critical atmospheric elements (e.g temperature, precipitation, wind, humidity and clouds). The purpose of the course is to provide students with an understanding of thermodynamic meteorological processes over synoptic and meso scales that contribute to cloud development, instability, precipitation, energy for cyclonic systems, fronts and meso-scale convective storms. This will include Chapters 1-8 in the course text (Stull) as well as powerpoint notes and handouts that will cover all topics in greater detail than the text. Reference to Canadian weather (atmosphere and surface) will be made throughout the course. Students should be prepared for mathematical/physical concepts to be treated in the course.

Term Work and Allocation of Marks

- Four (4) term assignments (10% each) = 40%
- Two quizzes (10% each) = 20%
- Two tests (20% each) = 40%

The due dates and details of the assignments will be provided in class. It will be important to attend the lectures and interact with myself and other students. Students will not be permitted to write make-up tests or hand in late assignments except for documented medical or compassionate reasons. A grade of zero will be recorded for missed assignments, tests and exams. Late assignments will be penalized 10% per day (including weekends and holidays). Students may have access to their marks prior to the voluntary withdrawal date (November 18, 2015) and are encouraged to talk with me before a decision to withdraw is made.

Course Outline

Module	Topic
1	Introduction
2	Energy & Temperature
3	Moisture and Stability
4	Thermodynamic Diagrams
5	Clouds (types and formation processes)
6	Cloud Growth & Precipitation

An assigned grade will correspond to the following range in marks:

A+	90% and over	C+	65-69%
A	80-89%	C	60-64%
B+	75-79%	D	50-59%
B	70-74%	F	less than 50%

Academic Dishonesty

Students should acquaint themselves with the University's policy on cheating and examination impersonation (see Section 7.0 of the University of Manitoba General Calendar). **Plagiarism and cheating in general, is a serious academic offence.**

The University of Manitoba has a new policy on electronic contact with students that requires **all email contact on university business to use students' official University email addresses**. The policy is at: http://umanitoba.ca/admin/governance/governing_documents/community/electronic_communication_wit_h_students_policy.html