



**University
of Manitoba**

**University of Manitoba
Faculty of Environment, Earth and Resources
Department of Environment and Geography**

COURSE INFORMATION

Course Title & Number:	GEOG 4670 Selected Issues (K01) Severe Thunderstorms: storm chasing & field techniques
Number of Credit Hours:	3
In-Class Times & Days of Week:	Mon/Wed 7:00pm - 10:00 pm
Location of Classes:	TBD
Students Taking the Course for Credit; Pre-Requisites:	If doing this course for credit, GEOG 2300 is required, while GEOG 3310 is recommended. U Winnipeg students must have completed at least one meteorology course (C grade or better).
Students Not Taking the Course for Credit; General Public Participants	No pre-requisites are required and no “formal” credit is given.
Tuition and Field Trip Fees	A 3 credit hour course tuition fee will be assessed (determined by U Manitoba each year). The field trip fee for 2023 is \$750, that covers vehicle rentals, accommodations, and fuel.
Instructors	All Instructors are professional meteorologists and avid storm chasers themselves, with many years of storm chasing experience.
Main Contact & Course Information	Dr. John Hanesiak; john.hanesiak@umanitoba.ca

Course is limited to 13 students; priority given to for-credit students;

First Come, First Served!

NOTE: everyone MUST have a valid passport (expiry no earlier than 2024)

General Course Information & Goals

The complete understanding of severe convective storms is often considered as one of the "final frontiers" in weather research. Atmospheric scientists who research this phenomenon must often take unique approaches to unlock the mysteries that confront them. One of these approaches has been popularized on television and in film... it is called "storm-chasing". The purpose of this course is to provide students with a basic understanding of atmospheric convection, severe thunderstorms, and the challenges of forecasting this phenomenon. The course will be a combination of in-class work and field experience. In class, students will learn convective processes, methods of analyzing and diagnosing weather data to predict severe and non-severe convection, basic use of weather radar and weather satellite information, and visual storm structure identification. The field trip follows the class work; it will be 7 consecutive days on the road with experienced storm-chasers where the class work will be put to the test to predicting tornadic thunderstorm environments, and chasing storms in a safe way. Students will also be able to observe thunderstorm phenomena.

NOTE: Your field fee covers van rentals, fuel and accommodations. Note that 3-4 people per room will be necessary. Students will be responsible for their own food during the field trip. Everyone will have to sign a UM waiver form to attend the field trip.

NOTE: everyone MUST have a valid passport (expiry no earlier than 2024)

Supplies Needed By All Students:

All students are required to bring colored pencils, pencil sharpener, thin black markers and a good eraser to every class and the field trip.

Class Schedule

This schedule is subject to change at the discretion of the instructor and/or based on the learning needs of the students but such changes are subject to Section 2.8 of the – [ROASS](#)- Procedure).

12 classes in total, 3 hrs each, 7-10pm, twice per week - Mondays and Wednesdays.

First class Monday May 1, 2023 and last class Monday June 12, 2023; note May 22 is a holiday.

7-day field trip, we usually have a two-day window for departure date depending on how long-range conditions look. The earliest departure date will be Jun. 17 (returning Jun. 23) and the latest departure date will be Jun. 19 (returning Jun. 25).

Class Topics:

- 1) Introduction to Severe Convective Storms**
- 2) Surface Analysis**
- 3) Stability and stability analysis**
- 4) Analysis of the Lower troposphere**
- 5) Middle and upper air analysis**
- 6) Shear versus Storm Types**
- 7) Shear LAB**
- 8) Miller Technique and NWP**
- 9) Miller Analysis**
- 10) Radar, Satellites and nowcasting**
- 11) Short-Range Forecasting & Tornado Forecasting**
- 12) Field trip Preparations, safety, storm spotting, Wx Outlook**