Physical & Environmental Sciences
UNIVERSITY OF TORONTO
S C A R B O R O U G H

Applied Climatology EES 1131H
Lecture: Wednesday 9-11am (BV 361)
Lab Session: Wednesday 11am-12noon (BV 466)
Instructor: Dr. Micah J. Hewer
Email: micah.hewer@utoronto.ca
Office Hours: Mondays 11am-2pm and Wednesdays 12noon-2pm (EV 350)

COURSE DESCRIPTION

This course will introduce and discuss the basic topics and tools of applied climatology, and how its concepts can be used in everyday planning and operations (e.g. in transportation, agriculture, resource management, human health, ecology and energy). This course involves the study of the application of climatic processes within the natural environment and the reciprocal interaction between climate and human activities. Students will have the opportunity to learn methods of analyzing and interpreting meteorological and climatological data that will be applicable to a variety of applied contexts at the interface of natural science and social science. This course is designed to forms the foundation upon which a climate change impact assessment (CCIA) can be conducted. Applied climatology is the study of casual relationships between weather and climate with human and environmental systems; this relationship is what informs the CCIA process.

COURSE OBJECTIVES

Upon completion of this course, students should have a basic understanding of what defines the field of applied climatology. Furthermore, students should become familiar with some of the key interactions between weather and climate with selected human and environmental systems. It is also the objective of this course to teach students research skills in the context of applied climatology that should be transferable to the workplace and valuable on the job market. Specific skills taught in this course will include becoming more proficient in Excel, evaluating and selecting representative weather stations, managing and organising large data sets, using simple linear regression models, determining the effect of seasonal climatic anomalies and analysing key climatic indicators and thresholds in the context of determining baseline conditions and trends.

EVALUATION

Lab Assignment 1 – Selecting a representative weather station: Climatic Distance (10%)
Lab Assignment 2 – Using linear regression and understanding seasonality (10%)
Lab Assignment 3 – The effect of seasonal climatic anomalies (10%)
Lab Assignment 4 – Assessing key climatic indicators and thresholds (10%)
Lab Assignment 5 – Student-selected case study in applied climatology (10%)
Course Participation – Weekly reading summaries and discussion questions (22%)
Oral Presentation – A case study in applied climatology (28%)

Evaluation will be carried out in accordance with the Graduate Grading and Evaluation Practices Policy (and how that policy is interpreted and applied in this Dept.)
http://www.governingcouncil.utoronto.ca/Assets/Governing+Council+Digital+Assets/Policies/PDF/grading.pdf

Lab Assignments (50%)

Detailed assignment instructions will be provided and reviewed within the lab session. It is expected that you will attend all these sessions to get a comprehensive understanding of the task and then to work through the process with your peers and the course instructor (if needed) during the following week. In general, the materials that are covered in lab sessions will not be brought up during the lectures. You must use the lab sessions and the course office hours to resolve any issues with the assignments.

Reading Summaries and Discussion Questions (22%)

Each student will be expected to come to class having read the required reading for that week. Course participation will be evaluated based on the submission of a printed page including a short summary (5-8 sentences) of the journal article being discussed that week. The article summary must include: the main research objective (1-2 sentences), the research methods (1-2 sentences), and the main findings (3-4 research sentences). Students must also include two (2) open-ended discussion questions at the end of the written summary which should demonstrate critical reflection upon the literature. Discussion questions can focus of rigour of the methodology, validity of the results, relevancy of the study or other theoretical aspects. There are eleven (11) weekly readings required for the course and therefore eleven (11) reading summaries will be expected. Each summary submission will be worth 2% of the final course grade, for a total weight of 22%

Oral Presentation (28%)

The oral presentations will be 20 minutes in length and will be given by pairs of students (working as partners) during the last week of the term. These presentations will represent a case study in applied climatology. Students will be expected to select an exposure unit of interest to them and then apply one or more of the analyses already completed in the lab assignments to answer a research question in the field of applied climatology. These findings will then be presented to the class and the oral presentation will be evaluated by the course instructor.

SCHEDULE:

Date	Lecture	Course Reading	Lab Session	Due Dates
Sep. 11	**Introduction to Applied Climatology**	First Week (No Reading)	First Week (No Lab)	
Sep. 18	*Selecting a representative weather station for applied climatology research*	Mohsin & Gough (2012)	Assignment 1 Instructions	
Sep. 25	**Weather, Climate and Forest Fires in British Columbia**	Shabbar et al. (2011)	Assignment 1 Workshop	Assignment 1 Due (Fri. Sep. 27 @ 5pm)
Oct. 2	*Using regression modelling in applied climatology*	Hewer & Gough (2016a)	Assignment 2 Instructions	
Oct. 9	**Weather, Climate and Human Health in Toronto**	Smoyer-Tomic & Rainham (2001)	Assignment 2 Workshop	Assignment 2 Due (Fri. Oct. 11 @ 5pm)
Oct. 16	*Determining the effect of seasonal climatic anomalies in applied climatology*	Hewer & Gough (2016b)	Assignment 3 Instructions	
Oct. 23	**Weather, Climate and Water Levels in the Great Lakes**	Gronewold et al. (2013)	Assignment 3 Workshop	Assignment 3 Due (Fri. Oct. 25 @ 5pm
Oct. 30	*Assessing key indicators and thresholds in applied climatology*	Hewer et al. (2015)	Assignment 4 Instructions	
Nov. 6	**Weather, Climate and Grape Growth in Ontario**	Shaw (2017)	Assignment 4 Workshop	Assignment 4 Due (Fri. Nov. 8 @ 5pm)
Nov. 13	*Developing relevant climatic indices for use in applied climatology*	De Freitas et al. (2008)	Assignment 5 Instructions	
Nov. 20	**Weather, Climate and Wheat Production in the Canadian Prairies**	Garnett & Khandekar (2015)	Assignment 5 Workshop I	
Nov. 27	**Weather, Climate and Fish Toxicology in the NWT (Canada)**	Evans et al. (2013)	Assignment 5 Workshop II	Assignment 5 Due (Fri. Nov. 29 @ 5pm)
Dec. 4 Dec. 6	No Lecture (Wednesday) **Student Presentations (Friday)**	Last Week (No Reading)	Last Week (No lab)	Presentation Due (Fri. room and time TBA)

EMERGENCY PLANNING

Students are advised to consult the university's preparedness site: http://www.preparedness.utoronto.ca, for information and regular updates regarding procedures relating to emergency planning.

ACCESSIBILITY NEEDS

The University of Toronto is committed to accessibility. If you require accommodations for a disability, or have any accessibility concerns about the course, the classroom or course materials, please contact The UTSC Accessibility Services as soon as possible: http://www.utsc.utoronto.ca/~ability/

We also suggest you also refer to the following University of Toronto Scarborough Library link: http://utsc.library.utoronto.ca/services-persons-disabilities

PLAGIARISM

University of Toronto code of Behaviour on Academic Matters states that "it shall be an offense for a student knowingly: to represent as one's own any idea or expression of an idea or work of another in any academic examination or term test or in connection with any other form of academic work, i.e., to commit plagiarism."

For accepted methods of standard documentation formats, including electronic citation of internet sources please see the UofT writing website at: http://www.writing.utoronto.ca/advice/using-sources/documentation

The full Code of Behaviour regulations could be found from consulting http://www.sgs.utoronto.ca/facultyandstaff/Pages/Academic-Integrity.aspx

WRITING AND ENGLISH LANGUAGE

As well as the faculty writing support, please see English Language and writing support at University of Toronto: http://www.sgs.utoronto.ca/currentstudents/Pages/English-Language-and-Writing-Support.aspx
Students have commented that they found the latter address extremely helpful for writing term papers.

The following are also useful:

Sylvan Barnett, *A Short Guide to Writing About Art*. 5-7th edition (New York: Harper-Collins, 1997)
William Strunk Jr., E.B. White. The Elements of Style (New York: MacMillan Publishing)

LATE WORK

Because this is a graduate course and the objective is to prepare students for the workplace, which may involve rigid deadlines, late work that is submitted without academic excuse will be penalised heavily. Late submissions will be penalised at the rate of 25% per day (including weekends and holidays), commencing immediately after the 5pm deadline on the due date. Therefore, for an assignment that was due on Friday at 5pm, a mark of ZERO will be attributed to the submission if it is submitted after 5pm on the following Monday.

READINGS

Optional Textbook: Applied Climatology – Principles and practice (1997). Edited by R. Thompson & A. Perry.

Several contemporary case studies in applied climatology, published in peer-reviewed academic journals, will be made available to students via Quercus to support in-class discussion and course objectives.