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, health 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 in a variety of applied contexts at the interface of natural science and social science.

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 selecting a representative weather station for a case study in applied climatology, establishing baseline climate conditions, statistical downscaling of local atmospheric conditions, preparing Global Climate Model ensembles for climate change projections and performing an impact assessment on a selected exposure unit.

EVALUATION

Lab Assignment 1 – Selecting a representative weather station (10%)
Lab Assignment 2 – Establishing baseline climate conditions (10%)
Lab Assignment 3 – Statistical Downscaling: Historical weather generator (10%)
Lab Assignment 4 – Preparing an optimal ensemble of Global Climate Model projections (10%)
Lab Assignment 5 – Statistical Downscaling: Future scenario generator (10%)
Course Participation – Weekly reading summaries and discussion questions (24%)
Oral Presentation – A case study in applied climatology (26%)

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.)
**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 TA 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 TA’s office hours to resolve any issues with the assignments. However, I too will be available to meet with you during office hours to discuss issues with the assignments.

**Reading Summaries and Discussion Questions (24%)**

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 methodology, validity, relevancy or theoretical discussion. Each summary submission will be worth 4% of the final course grade, for a total weight of 24%

**Oral Presentation (26%)**

The oral presentations will be 20 minutes in length and will be given by individual students across three weeks of lecture time at the end 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 the exercises already completed in the five 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**

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture</th>
<th>Course Reading</th>
<th>Lab Session</th>
<th>Due Dates</th>
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<tbody>
<tr>
<td>Jan. 8</td>
<td>Introduction to Applied Climatology</td>
<td></td>
<td>Assignment 1</td>
<td>Assignment 1 Due</td>
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<tr>
<td>Jan. 15</td>
<td>Climate Patterns and Forest Fires in Canada</td>
<td>Shabbar et al. 2011</td>
<td>Assignment 1</td>
<td>Assignment 1 Due</td>
</tr>
<tr>
<td>Jan. 22</td>
<td>Sea Levels, Coastal Flooding and Climate Change in Atlantic Canada</td>
<td>Thompson et al. 2009</td>
<td>Assignment 2</td>
<td>Assignment 2 Due</td>
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<tr>
<td>Jan. 29</td>
<td>Coasts, Water Levels and Climate Change in the Great Lakes</td>
<td>Gonewold et al. 2013</td>
<td>Assignment 2</td>
<td>Assignment 2 Due</td>
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<tr>
<td>Feb. 5</td>
<td>Influence of Climate on Mercury in Fish at Great Slave Lake</td>
<td>Evans et al. 2013</td>
<td>Assignment 3</td>
<td>Assignment 3 Due</td>
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<tr>
<td>Feb. 12</td>
<td>Climate change and Agricultural Production in Quebec</td>
<td>Brassard &amp; Singh, 2008</td>
<td>Assignment 3</td>
<td>Assignment 3 Due</td>
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<td>Feb. 19</td>
<td>Family Day (No Lecture)</td>
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<td>Reading Week</td>
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<td>Feb. 26</td>
<td>Climate Change and Road Pavement Performance in Canada</td>
<td>Tighe et al. 2008</td>
<td>Assignment 4</td>
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<tr>
<td>Mar. 5</td>
<td>Climate Change and Human Mortality in Quebec</td>
<td>Doyon et al. 2008</td>
<td>Assignment 4</td>
<td>Assignment 4 Due</td>
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<tr>
<td>Mar. 12</td>
<td>Tourism Climatology and Climate Change Impacts (Park Visitation, Zoo Attendance)</td>
<td>Hewer et al. 2016; Hewer &amp; Gough 2016</td>
<td>Assignment 5</td>
<td>Assignment 5 Due</td>
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<tr>
<td>Mar. 19</td>
<td>Student Presentations</td>
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<td>Assignment 5</td>
<td>Assignment 5 Due</td>
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<td>Mar. 26</td>
<td>Student Presentations</td>
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<tr>
<td>Apr. 2</td>
<td>Student Presentations</td>
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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 UoT 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:


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


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