GEOG 373

Applied Climatology

Spring 2021

Classes: Tues/Wed, 12:30 – 1:20 online

Labs: (Section B01): Wed 14:30 – 16:20 online
(Section B02): Thu 14:30 – 16:20 online

This course seeks to equip you with an understanding of how climate acts at the regional scale and how it interacts with other natural and human parameters/features to allow you to:

a) utilize computer analyses and tools to answer questions about how climate affects certain sectors, and

b) engage a planning process as a "climatic analysis needs" specialist.

Learning Objectives:

1. Identify the basic climate controls, large-scale and small-scale, that act upon a given location.
2. Explain how these climate controls work to create a local-scale climate.
3. Be aware of various quality-control issues to be alert for when working with data.
4. Explain strategies for handling these issues, their limitations, and implications to bear in mind when employing them during an analysis.
5. Analyze and/or present data using a variety of statistical and spatial tools.
6. Perform a directed data analysis that is conducted in the context of an application.
7. Gain familiarity with how climate intersects human activities in several sectors (eg transport, agriculture, hydrology).

Laboratories:

This course has a computer laboratory component that will emphasize the ingest and analysis of data using a programming language called Python. Data analyses will be directed to support conclusions/decisions concerning applied climate scenarios and problems that are presented. They are an essential part of the course and **attendance is required**. There will be reports due: see below for detailed schedule. All lab reports must be neatly typed and figures must be cleanly and correctly presented. In particular, labs will give you practice dealing with data (brining it in, preparing it for analysis, and preparing summary plots/tables/statistics) using Python programming language. There is a lot of tutorial material on Python that I strongly urge you to spend time at the beginning of term working through to gain proficiency with this system. Preparing synthesis reports is a major skill needed in today's job market. Analysis and presentation of data is a necessary skill in all fields.

**** Labs are due before the start of the next new lab. For example for section B01 (B02), lab "Python 1" would be due before your "Python 2" Lab starts on Feb 10 (11).**

** You have a lot of time for these labs. Plan your time wisely because we won't entertain last minute pleas for extensions. Even if something serious comes up in the day or two before lab is due, the majority of it should already be finished. -10% per day late.

Online Learning: This course is hosted on the UVic Brightspace system. http://bright.uvic.ca/ You will find the course and lab zoom link and all course materials at your 373 Brightspace site.

Textbooks:

Carrega, Pierre (ed.). 2010. G*eographical Information and Climatology*. Wiley Press.

This is a translation of a text that has been popular in France. The translation is a little weak in places, rendering the flow a little stilted in spots. However I felt the exploration of the direct integration between applied climatology and the use of GIS tools to be very motivating and the book covers a lot of interesting ground that will be of benefit for you to have exposure to.

Other readings from the textbook by Aguado and Burt that cover some of the physical process gaps in Carrega will be assigned and provided by me.

Please read the material from the text and case studies. Lecture material will generally follow the readings. All readings are testable.

Computer use: In the laboratories, we will be doing exercises using the computer using the Python programming language. You should be familiar with basic computer skills such as file maintenance and word processing. It will be easiest if you install python locally on your own computer. We will show you how to do this in the first week.

Evaluation: The course grade will be based on the following:

		Date (or date due)	Weight	Subject
1	Test 1			

This is our objective but timings and topics may change as we see how rapidly we progress.

Wk	Date	**Lecture Subject**	Exam	Lab	Module
1	T Jan 12	Course intro and structure – concept map presentation		Install	
	W Jan 13	Process I: Radiation		Install	
2	T Jan 19	Process II: Pressure and winds		Jupyter	
	W Jan 20	Process III: Storms, advection concepts		Jupyter	
3	T Jan 26	Process IV: Local modifiers		Python 1	
	W Jan 27	Process overflow, idea of other factors beyond meteorology		Python 1	
4	T Feb 2	**Process module test**	Test 1	Python 1	
	W Feb 3	Information I: Data gathering		Python 1	
5	T Feb 9	Information II: Data analysis I – linear stats, error, extremes		Python 2	
	W Feb 10	Information III: Data analysis II – spatial- contouring, stats		Python 2	
6	T Feb 16	**Reading week: No classes**		Python 2	
	W Feb 17	**Reading week: No classes**		Python 2	
7	T Feb 23	Information IV: Scale concepts, station representativeness		Python 3	
	W Feb 24	Information V: Modeling		Python 3	
8	T Mar 2	**Information module test**	Test 2	Python 3	
	W Mar 3	Application I: Wild fire		Python 3	
9	T Mar 9	Application II: Urban II		Python 4	
	W Mar 10	Application II: Urban II		Python 4	
10	T Mar 16	Application III: Indigenous/Northern		Python 4	
	W Mar 17	Application III: Indigenous/Northern		Python 4	
11	T Mar 23	Application IV: Transportation		Python 5	
	W Mar 24	Application V: Agriculture		Python 5	
12	T Mar 30	Application VI: Hydrology I		Python 5	
	W Mar 31	Application VI: Hydrology II		Python 5	

Undergraduate Grading**

Passing Grades	*Description*
A+ A A-	**Exceptional, outstanding and excellent** performance. Normally achieved by a minority of students. These gr sinr