York University
Faculty of Liberal Arts and Professional Studies
Department of Geography

AP/SC/GEOG 2240 3.0 - Introduction to Statistical Analysis in Geography

Course Outline - Fall, 2019

Prerequisites
24 Credits successfully completed

Exclusions
AP/ECON 2500 3.00, AP/POLS 3300 6.00, AP/SOCI 3030 6.00, HH/KINE 2050 3.00, HH/KINE 3150 3.00, HH/PSYC 2020 6.00, HH/PSYC 2021 3.00, SC/BIOL 2060 3.00, SC/MATH 2560 3.00, SC/MATH 2565 3.00, SC/MATH 2570 3.00, AK/ADMS 3320 3.00

Lectures
Monday and Wednesday 13:30 – 14:20
Ross S205

Labs
Lab 01 – Thursday 10:30 – 12:20
Lab 02 – Thursday 8:30 – 10:20
Ross N302

Course Director
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Course Description
This introductory course aims to provide a working knowledge of several statistical techniques which are widely used in many branches of geography. Some attention is also given to broader questions concerning the nature of the scientific method.

Course Objectives
This course will serve to introduce you to the ways in which geographers think about, and analyze data. In order to do so we must first understand the kinds of data commonly generated by geographers. We will then work through the ways in which these different data can be analyzed. The labs in the course will give you an opportunity to utilize software commonly applied to statistical analyses in geography, and interact with real-world datasets. By the end of the course you will understand, and be able to carry out, many of the core analyses of geographic data.

Course Materials

Textbook:
Bluman, Allan G. 2018. Elementary Statistics, A Brief Version, 8th edition. McGraw-Hill.
Required, available at the bookstore.

You may also find used copies of the 7th (2015) edition of the same title. You are welcome to use these if you wish, but the 2018 edition will be the version of record, and it is solely your responsibility to be aware of any discrepancies. All page references in this syllabus, and throughout the term, will be to the 8th edition.

Assigned readings are listed in this syllabus. I reserve the right to change or assign additional readings as appropriate.

Course website:
GEOG 2420 will have an active Moodle environment that will be your primary hub for all information related to the course. Please check Moodle regularly for the most up to date course information and news. Assignments will be submitted through Moodle.

iClicker (Reef) Cloud:
During lectures we will be using the iClicker Cloud (aka iClicker Reef) software to conduct informal polling and review. The software, and thus polls, can be accessed via your smartphone, laptop, or tablet devices. In order to use this software you will need to sign up for an account if you have not already done so. Once that is completed add **AP/SC/GEOG2420A LEC** to your courses.
Find more information, and links to download the app at: http://lts.info.yorku.ca/polling-student/

Piazza:
This term we will be using Piazza for class discussion (or trying it out at least, it is new to me). The system is catered to getting you help fast and efficiently from classmates, the TAs, and myself. Rather than emailing questions to the teaching staff, I encourage you to post your questions on Piazza, where everyone can contribute, and learn from, answers. I will speak about Piazza more in the first week of class.
Find our class page at: https://piazza.com/yorku.ca/fall2019/geog2420/home

Software:
For labs and in lecture the following software packages will be used: Microsoft Excel and the R statistical computing environment. These can be accessed on campus computers in the public labs or they can be downloaded for your own use free of charge (R is an open source program, and Microsoft Excel is available through your York Office 365 credentials). Further instructions on this will be provided in the first lab period.

Tentative Schedule and Topics for the Course (Subject to modification)

Lectures:

Date	Class Topic	Textbook Readings
Sept 4	Intro to 2420 and course policies	-
Sept 9	An introduction to statistics	Chapter 1
Sept 11	Frequency distributions	Chapter 2
Sept 16	Central Tendency 1	Chapter 3
Sept 18	Central Tendency 2	Chapter 3
Sept 23	Probability 1	Chapters 4, 5
Sept 25	Probability 2	Chapters 4, 5
Sept 30	The Normal Distribution 1	Chapter 6
Oct 2	The Normal Distribution 2	Chapter 6
Oct 7	Confidence Intervals 1	Chapter 7
Oct 9	Confidence Intervals 2	Chapter 7
Oct 14, 16	**Fall reading week**	
Oct 21	Hypothesis Testing 1	Chapter 8
Oct 23	**TEST #1**	
Oct 28	Hypothesis Testing 2, Testing Differences 1	Chapters 8, 9
Oct 30	Testing Differences 2	Chapter 9
Nov 4	Data Associations	Chapter 10
Nov 6	Correlation 2	Chapter 10
Nov 11	Regression 1	Chapter 10
Nov 13	Regression 2	Chapter 10
Nov 18	The Chi-Square Test	Chapter 11
Nov 20	ANOVA 1	Chapter 11
Nov 25	ANOVA 2	Chapter 11
Nov 27	Spatial Statistics	-
Dec 2	Course review	-
December 5-20, TBD	**TEST #2 (FINAL)**	

Labs:

Date	Lab Topic	Lab Due Date (by 9 pm)
Sept 5	MS Excel basic workshop	-
Sept 12	Lab 1: All about data!	Sept 18
Sept 19	Lab 2: Descriptive statistics	Sept 25
Sept 26	R workshop	-
Oct 3	Lab 3: Probability and z scores	Oct 9
Oct 10	Lab 4: Confidence intervals	Oct 23
Oct 31	Lab 5: Testing for differences	Nov 6
Nov 7	Lab 6: Associations in data	Nov 13
Nov 14	Lab 7: Regression	Nov 20
Nov 21	Assignment information	Dec 2

Laboratory Exercises / Assignments:

There will be two laboratory skills workshops held in the lab periods. These workshops are designed to provide familiarity with the software we will be using in the labs this year. There are no assignments to be handed in with these workshops, and thus, they are technically "optional." However, attendance at these workshops should benefit you greatly, especially if you are unfamiliar with one (or both) of the programs we will be using. As such, there are bonus attendance marks for taking part in the workshops.

There will be 7 laboratory assignments to be submitted during the term. **The best 6 of the 7 laboratory exercises will count toward your final grade**. These will involve the use of spreadsheets and statistical software and will be held in computer labs. Lab assignments must be typed and are to be uploaded on Moodle by their due date (labs will be due at 9 pm on the Wednesday following each lab week). You will be permitted to upload late assignments and the time you do so will be recorded by Moodle. The time you are late (recorded to the nearest minute) will be rounded up to the nearest day. At the end of the course, your cumulative late times and late penalty will be calculated. You will be permitted 5 "free" late days for the entire course. Once these late days are used up, subsequent late labs will receive a grade of 0 unless you have a valid medical reason or there are other extenuating circumstances and notify the instructor by email as soon as possible.

Students are responsible for creating and managing external backups of their computer files and stopping their work far enough in advance to upload their assignments before they are due. You will be expected to provide proof (a screen shot) if you are not able to upload your work to Moodle due to a technical malfunction.

Laboratory exercises serve to reinforce and solidify concepts from the lectures. You are encouraged to learn from each other and discuss your approaches with others during the lab sessions, but please submit your own individually-written lab reports that contain your own analyses and answers to questions to ensure that you actually learn from these exercises. Discussions (in the lab sessions, on Piazza/Moodle or otherwise) are for gaining guidance and clarity on a topic. Students sharing/posting/copying answers will be in breach of the policy on Academic Honesty and Plagiarism (see below).

In the last lab period (Nov 21) you will be given a "choose your own stats adventure" assignment, which will be due as usual the following week. This will be an opportunity to practice some of the skills you have acquired over the term by applying them to an interesting data set we provide. More information will be provided in lab regarding this assignment.

Examinations

There will be two tests in GEOG2420. Test #1 will occur the Wednesday after Fall Reading Break, in-class on **October 23, 2019**, covering class and textbook material presented prior to the reading week break. All of the material covered in the assigned textbook chapters is considered testable, even if it is not covered specifically in lecture. Test #1 will account for 25% of your mark.

Test #2 will occur in the university's scheduled exam period in December, which runs from **December 5 – 20, 2019**. It is your responsibility to ensure you are available to write this test, whatever date it is scheduled, during this window. Do not make end of term travel plans until the confirmed, final date of the exam is released by the university. Test #2 will be cumulative in nature, covering all the material and textbook readings assigned throughout the term. Test #2 will account for 30% of your mark.

One study sheet aid can be brought with you to the tests. This study sheet MUST adhere to the following rules:

- Be 8.5" x 11" standard size paper (lined or unlined, with or without holes – no legal paper!) Double-sided is OK
- Completely handwritten (no typing, and the original used – no scans or photocopies)
- No sharing of study sheets is allowed either during the exam if a student forgets one, or through photocopying/scanning/etc. in advance. Each student must have their own unique sheet in their own writing
- May include anything you'd like to put on the study sheet (e.g. formulas or instructions on how to solve a problem), including the use of colored pens, highlighters, different sized writing, etc. Whatever works for you!
    - Keep in mind that formulas will not be provided on the exam.
    - Any necessary tables (p values for example) WILL be provided on exams (no need to transcribe them to your study sheets)
- Study sheets will be handed in with your test

Marks Breakdown Summary

Laboratory Exercises x 7, lowest mark dropped	36%
Final Assignment	9%
Test #1	25%
Test #2	30%
Participation Bonus	(up to 4%)

Grades

90%-100:	A+	60-64:	C
80-89:	A	55-59:	D+
75-79:	B+	50-54:	D
70-74:	B	40-49:	E
65-69:	C+	0-39:	F

Course and University Policies

Late assignments:
As outlined above, you will be allowed a TOTAL of 5 cumulative late days for all of the 7 assignments in 2420. After you have reached this total, late assignments will receive a mark of 0 unless appropriate documentation is provided. No exceptions will be made.

Missed exams:
It is the student's responsibility to be available to take examinations in the scheduled times. Formal requests for deferred examinations must be accompanied by the appropriate paperwork and documentation. Students who miss the midterm test #1 for valid reasons will be required to write the final test #2 with a combined mark weight of 55%.

Attendance / Class Participation:
I strongly encourage class participation and student questions when concepts are not clear. I will post my lecture notes on Moodle for you to access before the class, but these are not a substitute for coming to lecture as they are: a) skeletal in nature, b) do not incorporate discussions / tangents that inevitably occur, and c) will not include the example calculations / data that I work through in class.

Lab Participation Bonus Points:
A bonus of up to 4% will be applied to your final grade and will be calculated as follows. These will be the only extra/bonus credit offered in the course.

- If you submit all 7 lab assignments and score at least 20% on them all (to ensure that you put in some effort) you will get a bonus of 2%
- You will get a bonus of 1% for each skills workshops you attend (and remain until the end).

Email Policy:
Instructor-student interaction occurs in the classroom and during office hours. Email contact is limited to questions requiring simple yes/no answers, making appointments, and dealing with emergencies. For all emails related to the course please include GEOG2420 in the subject line. Please come to my office hours or see me after class if you wish to discuss class content. Alternatively, try using the Piazza forum to get help with material from myself, the TAs, or your fellow classmates.

Additional Assistance and Important Information:
The instructor is willing to make any reasonable accommodations for students with limitations due to disability. If you need special accommodations in order to meet any of the requirements of this course, please contact me as soon as possible. Students will be allowed to complete examinations or other requirements that are missed because of a religious observance.
The university has a responsibility to promote academic honesty and integrity and to develop procedures to deal effectively with instances of academic dishonesty. Students are responsible for the honest completion and representation of their work, for the appropriate citation of sources, and for respect of others' academic endeavors.

Plagiarism:
The University policy on academic honesty and plagiarism can be found at the following link, which I expect you to review.
http://secretariat-policies.info.yorku.ca/policies/academic-honesty-senate-policy-on/
As well, please see the online tutorial at: https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/

Resources

York Learning Commons
The Learning Commons unites learning services to better support students' academic success. Together in the Learning Commons, learning services (such as library research support, writing instruction, learning skills and careers services) collaborate to offer students enriched support and learning resources. The Learning Commons services support students as they develop the many skills, tactics, and strategies required for success in university and beyond.
http://learningcommons.yorku.ca/

Student Accessibility Services
N108 Ross Building or N204 Bennett Centre
Tel: 416-736-5755
E-mail: sasinfo@yorku.ca
https://accessibility.students.yorku.ca/

Geographic Resource Centre (GRC)
S403 Ross Building
- The GRC is a quiet research and study facility for students in the Dept. of Geography. Computers are available for student use, including internet access, access to digital course material, and MS Office software. Various geomorphology textbooks are also available should students want to supplement their learning in the course.

Social Media
The Department of Geography at York University maintains an active social media presence to communicate with students:
Facebook: https://www.facebook.com/YorkUGeography/
Twitter: https://twitter.com/YorkGeography