

## GEOGRAPHY FINAL COURSE OUTLINE: SUMMER 2021

### GEOGRAPHY 582 GFC HOURS (3-0) Technology, Society, and Space

Section	Days	Time	Location
LEC 01			TRAVEL STUDY

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#### Official Course Description

Explores the relationship between spatial technologies and social/political systems. Examines the ways geographers have made sense of the social construction and societal implications of technologies across time and place.

#### Unofficial title

Artificial Intelligence for Community Public Health: Seattle

#### Course Objectives

Geography 582 will comprise the pre-departure course for the summer 2021 overseas field school entitled “Artificial Intelligence for Community Public Health”. This course will focus on developing the key interdisciplinary conceptual and technical skills necessary to ensure a successful field school in Seattle.

This is a two-part experiential course (across GEOG 582 and GEOG 596) designed to help students develop and apply computational skills for aiding community public health. Students will develop these skills in close collaboration and consultation with data scientists and a partner organization, based at the University of Washington eScience Institute’s Data Science for Social Good program. The major learning goals are around artificial intelligence (AI), but students will also develop their applied critical problem-solving skills and deep understanding of urban social and political geographies.

Over the past decade, public health practitioners have increasingly directed energy and resources to AI methods, to see whether and how these new computational approaches might improve their work’s efficacy. At the same time, new concerns have been raised about the impacts of AI on health equity, due to some groups’ social position and other socially-determined circumstances. This concern has motivated a nationwide Canadian initiative called “AI for Public Health”, spearheaded partly by University of Calgary researchers, to host a summer institute to directly tackle the challenge of health equity in the context of new AI approaches.

In this program, students will address this challenge in a city uniquely positioned to contribute to community public health. Seattle is home to a famously rich technology industry, a world-class public health educational program, and a diversity of organizations working on community well-being. The Data Science for Social Good program, held every summer since 2015, has been at the forefront of connecting these various actors. Students participating in this study abroad program will have a diverse range of skills prior to departing, and will develop technical, interpretive, creative, and analytical skills in the course of this program. They will also develop their professional networks and key networking skills, and will learn from other students, researchers, and practitioners at the eScience Institute.

### Course Learning Outcomes

The Department of Geography is committed to student knowledge and skill development. The table below lists the key learning outcomes for this course, the program-learning outcomes to which they contribute, and the expected level of achievement.

**By the end of this course, students should be able to:**

Course Learning Outcomes	PLO(s) *	Level(s) **
Evaluate different artificial intelligence algorithms for their suitability to particular public health-related inquiries.	3,4,6,8	3
Explain the major areas of research that intersect urban geography, public health at the community scale, and artificial intelligence.	1,2,5,7,8	3
Compose a simple script that demonstrates your critical reflection on the role of computation in community well-being and community health.	1,2,3,4,6,7,8	3
Critically interrogate the different roles technologies are said to play in urban settings.	3,4,5,7,8	3
Explain how community public health problems can be approached as <i>geographic</i> problems.	1,2,5,7,8	2

*\*PLOs = Program Learning Outcomes: 1 = reflect and communicate diverse human-environment perspectives, 2 = identify and explain human-environment processes, 3 = implement sampling, data collection, analyses and communication methods, 4 = analyze spatial and temporal aspects of human-environment systems, 5 = employ knowledge, arguments, and methodologies for solving human-environment problems, 6 = evaluate geospatial data and manipulate it to create cartographic products, 7 = communicate geographic concepts using oral, written, graphic, and cartographic modes, and 8 = demonstrate literacy skills.*

*\*\*Levels: 1 = Introductory, 2 = Intermediate, and 3 = Advanced.*

### Prerequisites:

Advanced coursework in at least one of: (1) computer science, (2) urban geography, (3) public health, (4) human geography; OR graduate student standing.

A working knowledge of computer science principles is desirable but not necessary. Each student team will have someone with technical expertise and others with topical expertise.

### Learning Resources

Required readings will be posted to the course D2L.

### Grading (Weighting)

Weight	Assessed Components	Due
10 %	Basic script	July 17, 11:59pm
10	Basic ML script	July 18, 11:59pm
10	Web scraping script	July 23, 11:59pm
10	AI "concept map"	July 23, 11:59pm
10	Mental map of urban studies, public health, and artificial intelligence (note: make this spatial)	July 25, 11:59pm
25	Reflection extended abstract	July 27, 11:59pm

25	Final predeparture “test”	July 24, anytime during the day
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*There is no final exam for this course.*

### **Scripts**

Nearly every day of this course you will practice your scripting skills by developing a script with a particular purpose in mind. I will give you detailed instructions for each of these scripts. For those of you for whom this is elementary, I encourage you to tackle “bigger” and more creative problems. Together, I hope that these three scripts will gently ease you into the world of scripting, and provoke you to think creatively about sources of data and computational approaches.

### **AI Concept Map**

You will create a concept map of AI approaches and application areas, in order to prepare you for quickly deciding a particular AI approach once you’re in the field. In this assignment, I expect you to independently summarize, in graphical form, how you conceive of the layout of the field of AI. You can think of this as a graphical essay, or a visual literature review: in your submission, I hope to see that you’re familiar with the contours that shape the field as a whole – big areas broken down into smaller challenges and application areas, with lots of connections between them all. I will give further practical instructions in each assignment handout, but I expect that you will be able to use Freemind, Visio, or Illustrator for this assignment.

### **Mental map**

This assignment is very similar to the previous one, but will instead focus on the overlaps between the three focus areas for this course: urban geography, public health, and AI. You will create either a digital or analog diagram of each field’s core concerns and debates, and the overlaps between them. Here, instead of detailing each area, I hope that you will identify areas in which you feel familiar, and areas in which you are less familiar. You will share this diagram with your classmates, and you will collectively use these resources to help you identify others’ skills once we get into the field. For example, if you’re comfortable thinking through technology and cities, but less in programming, you will know who to consult when you run into such problems.

One of your key tasks here will be to convey in this mental map how one might approach the various problems through a *geographic* lens – and you should be explicit about this. There is no single “right” answer to this requirement: geographers think through many different lenses that are characteristic of a geographic frame of thinking. Among the many ways you could approach this question is through space, place, location, distance (and other spatial metaphors), topology, networks, or human-environment relations.

### **Extended abstract**

Within the first two days of being in the field, you will submit a reflection “essay” explaining, from an overtly *geographic* perspective, how you think technologies like AI, data science, and machine learning can or should be used to address urban public health problems. In this extended abstract I expect you to very carefully and critically approach your claims. I also expect you to reflect on your immediate reaction to being in the field – in what ways have the first few days been what you expected, and in what ways has it already been different?

This extended abstract should be about 1500 words.

### **Pre-departure test**

To wrap up the week’s learning, and help solidify many of the lessons in your mind, I will offer you a series of questions for which you will compose short written responses. I will offer the class 10

questions, and I will expect you to answer 3 of them with about 300-500 words each. This assignment is less of a final exam and more of a recap. It will also help me figure out where everyone's landing, to assist in assigning small task groups once we get into the field.

- It is essential to pass all components to pass the course as whole.
- Given the intensive timeline of this course, your punctual submission of assignments is crucial, and the late penalty proportionally steep. I will allow one (and only one) chance to re-submit work throughout the course. This late assignment will be penalized 10% per 24 hours of tardiness.

### Grading System

96 – 100	A+	77 – 80	B	59 – 61	C-
90 – 95	A	71 – 76	B-	55 – 58	D+
86 – 89	A-	65 – 70	C+	50 – 54	D
81 – 85	B+	62 – 64	C	0 – 49	F

In the event that a student misses any course work due to illness, supporting documentation, such as a medical note or a statutory declaration will be required see: <https://www.ucalgary.ca/pubs/calendar/current/m-1.html>. We will accommodate reasonable unexpected difficulties related to health and wellbeing.

Please refer to <https://www.ucalgary.ca/registrar/registration/appeals/student-faq> for frequently asked questions concerning the provision of a medical note/statutory declaration.

### Supplementary Fees

No supplementary fees will be assessed.

***For additional detailed course information posted by the instructor, visit the course Desire2Learn page online at <https://d2l.ucalgary.ca/d2l/home>.***

### **SUPPLEMENTAL INFORMATION**

*Learning Technologies and Requirements In order to successfully engage in their learning experiences at the University of Calgary, students taking online, remote and blended courses are required to have reliable access to the following technology.*

- A computer with a supported operating system, as well as the latest security and malware updates
- A current and updated web browser
- Webcam (built in or external)
- Microphone and speaker (built-in or external) or headset with microphone
- Broadband internet connection

### Principles of Conduct

The University Calendar includes a statement on the principles of conduct expected of all members of the university community (including students, faculty, administrators, any category of staff, practicum supervisors, and volunteers), whether on or off university property. This statement applies in all situations where members of the university community are acting in their university capacities. All

members of the university community have a responsibility to familiarize themselves with the principles of conduct statement, which is available at: [www.ucalgary.ca/pubs/calendar/current/k.html](http://www.ucalgary.ca/pubs/calendar/current/k.html).

### **Plagiarism, Cheating, and Student Misconduct**

The University of Calgary is committed to the highest standards of academic integrity and honesty. Students are expected to be familiar with these standards regarding academic honesty and to uphold the policies of the University in this respect.

Academic dishonesty is not an acceptable activity at the University of Calgary, and students are **strongly advised** to read the Student Misconduct section in the University Calendar at: [www.ucalgary.ca/pubs/calendar/current/k-3.html](http://www.ucalgary.ca/pubs/calendar/current/k-3.html). Often, students are unaware of what constitutes academic dishonesty or plagiarism. The most common are (1) presenting another student's work as your own, (2) presenting an author's work or ideas as your own without adequate citation, and (3) using work completed for another course. Such activities will not be tolerated in this course, and students suspected of academic misconduct will be dealt with according to the procedures outlined in the calendar at: [www.ucalgary.ca/pubs/calendar/current/k-5.html](http://www.ucalgary.ca/pubs/calendar/current/k-5.html).

### **Instructor Intellectual Property**

Information on Instructor Intellectual Property can be found at <https://www.ucalgary.ca/policies/files/policies/Intellectual%20Property%20Policy.pdf>

### **Freedom of Information and Protection of Privacy**

Freedom of Information and Protection of Privacy (FOIP) legislation in Alberta disallows the practice of having students retrieve assignments from a public place, such as outside an instructor's office, the department office, etc. Term assignments will be returned to students individually, during class or during the instructor's office hours; if students are unable to pick up their assignments from the instructor, they must provide the instructor with a stamped, self-addressed envelope to be used for the return of the assignment.

### **Human subjects**

Students in the course will not be expected to participate as subjects or researchers when research on human subjects may take place.

### **Internet and electronic communication device information**

There are not restrictions on the use of laptops and tablets in class if they are used to take notes or find information relevant to the class, and if there is no disturbance or distraction of other students or the instructor. Phones must be turned off during class, unless you have previously identified yourself to the instructor as a health care or law enforcement professional.

### **Posting of Grades and Picking-up of Assignments**

Graded assignments will be returned by the instructor or teaching assistant personally during scheduled lecture or laboratory periods, unless they are made available electronically through the course D2L webpage. Grades and assignments will not be available at the Department of Geography's main office.

### **Academic Accommodations**

It is the student's responsibility to request academic accommodations, according to the university policies and procedures listed in the University Calendar.

The student accommodation policy can be found at: [www.ucalgary.ca/access/accommodations/policy](http://www.ucalgary.ca/access/accommodations/policy).

Students needing an accommodation because of a disability or medical condition should communicate this need to Student Accessibility Services in accordance with the Procedure for Accommodations for Students with Disabilities: [www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf](http://www.ucalgary.ca/policies/files/policies/student-accommodation-policy.pdf).

Students needing an accommodation based on a protected ground other than disability should communicate this need, preferably in writing to their instructor or the Department Head (email: [david.goldblum@ucalgary.ca](mailto:david.goldblum@ucalgary.ca)).

### **Copyright Legislation**

All students are required to read the University of Calgary policy on Acceptable Use of Material Protected by Copyright ([www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf](http://www.ucalgary.ca/policies/files/policies/acceptable-use-of-material-protected-by-copyright.pdf)) and requirements of the copyright act (<https://laws-lois.justice.gc.ca/eng/acts/C-42/index.html>) to ensure they are aware of the consequences of unauthorised sharing of course materials (including instructor notes, electronic versions of textbooks etc.). Students who use material protected by copyright in violation of this policy may be disciplined under the Non-Academic Misconduct Act.

### **Wellness and Mental Health Resources**

The University of Calgary recognizes the pivotal role that student mental health plays in physical health, social connectedness, and academic success and aspires to create a caring and supportive campus community where individuals can freely talk about mental health and receive supports when needed. We encourage you to explore the mental health resources available throughout the university community, such as counselling, self-help resources, peer support, or skills-building available through the SU Wellness Centre (Room 370, MacEwan Student Centre, <https://www.ucalgary.ca/wellnesscentre/services/mental-health-services>) and the Campus Mental Health Strategy website (<http://www.ucalgary.ca/mentalhealth/>).

### **Contact Information for Student and Faculty Representation**

- Student Union VP Academic 403-220-3911, [suvpaca@ucalgary.ca](mailto:suvpaca@ucalgary.ca)
- Students Union Representatives for the Faculty of Arts – 403-220-3913, [arts1@su.ucalgary.ca](mailto:arts1@su.ucalgary.ca), [arts2@su.ucalgary.ca](mailto:arts2@su.ucalgary.ca), [arts3@su.ucalgary.ca](mailto:arts3@su.ucalgary.ca), [arts4@su.ucalgary.ca](mailto:arts4@su.ucalgary.ca)
- Student Ombuds Office information can be found at: [www.ucalgary.ca/ombuds/](http://www.ucalgary.ca/ombuds/)

### **Campus Safewalk**

Campus Security, in partnership with the Students' Union, provides the Safewalk service, 24 hours a day, to any location on Campus, including the LRT station, parking lots, bus zones, and university residences. Contact Campus Security at 220-5333 or use a help phone, and Safewalkers or a Campus Security officer will accompany you to your campus destination.