

Geography N80

Digital Worlds: Introduction to Geospatial Technologies

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Office hours: 583 McCone Hall, Tuesdays by appointment

Schedule: Tues-Wed-Thurs, 10:00-12:30, CAGE Lab

Lectures, Tuesdays & Thursdays; Labs, Wednesdays

Course description

The goal of this course is to introduce students to some of the digital mapping and geospatial technologies used in geography and other fields, which increasingly underpin contemporary digital society. The class covers this material in a three fold way.

First, we will learn about key ideas that underpin geospatial tools and technologies to understand the conceptual basis of how things work beyond the point-click-type operations of the tools themselves. Under this theme, we will look at topics such as map projections, spatial data types, simple types of spatial analysis, map design, and so on.

Second, we will develop these ideas further through lab assignments designed to introduce common tools and methods, especially web-mapping, the Global Positioning System (GPS), and a first look at Geographical Information Systems (GIS).

Third, we will link tools and methods to the field of geography. Lectures will cover key geographical concepts such as scale, space/place, relationality, and neighborhoods. Rather than just focusing on the technical, these concepts will help orient our thinking on how digital tools represent the world, and what their limitations might be within those representations. This aspect of the course will also encourage consideration of the wider social and ethical implications of these technologies, particularly with regard to privacy, surveillance, and data ownership.

In this course we strive for breadth of coverage of the field rather than in-depth inquiry on any one topic. By the end of the course you will have a grasp of key concepts and experience using some of the main tools currently used in web mapping, but you will not be an expert in any one of them. If you are interested in becoming fluent in one of these tools or more advanced application of GIS concepts, consider building off this course with other classes listed in the GIS Minor offered by the departments of Geography, Environmental Science Policy and Management, and the College of Environmental Design: <http://nature.berkeley.edu/advising/minors/gist>

Note that the minor is approved in all three Colleges of Letters and Science, Natural Resources and Environmental Design.

Course website

All course materials will be posted on bCourses, including readings, lecture slides, and syllabus updates. Please make sure your bCourses preferences are set to receive updates regularly by email so you don't miss any announcements.

Schedule

Lectures will generally be delivered in 2 parts with a break in between. For the most part we will be working on a grand single theme per class period, but occasionally we will have more mixed days, such

as the week of the midterm exam. While this syllabus will be posted on the web site, please consider the schedule a living document based on the needs of the class, and check bCourses for any updates during the course.

Week	Tuesday	Wednesday	Thursday
19 June	Welcome & Syllabus	Lab introduction: computer lab rules + HTML	Course overview Anatomy of a web map
26 June	Scale	Lab 1	Projection
3 July	NO CLASS, 4 th of July	Lab 2	Location
10 July	Space, Place, and Data	Lab 3	Mapping <i>place</i>
17 July	MIDTERM & Neighborhoods and regions	Lab 4	Polygons social data, gerrymanders
24 July	Geodemographics heatmaps and polygons	Lab 5	Distance, movement, time
31 July	Simulations geodemographics 2	Lab 6	Geospatial ethics
7 August	Final review		FINAL EXAM

Labs

Lab assignments are due in bcourses by **Tuesday night at 9pm** unless otherwise announced. Late assignments will not be accepted without permission of the instructor *BEFORE* the due date.

*The first lab period is mandatory to gain access to the lab outside of class period. **Please remember your ID cards!***

Each assignment will consist of written instructions plus any additional data files necessary to build the map. Instructions are generally designed to help you through major conceptual steps, but will leave room for you to figure out the details by yourself. This way, I hope, each new technology you work with will be more memorable when you come back to it after the course. If you have trouble, I will be in the lab during class time on Wednesdays to help out with any questions. Helping and asking for help from your classmates is also strongly encouraged, but final products must be your own individual work, as per the **Academic Integrity Policy**, found at the end of this document.

Lab schedule

	Theme	Main technology	Grade weight
Lab 0	Lab Rules + HTML basics	HTML	2 %
Lab 1	Web map basics	Leaflet	10 %
Lab 2	Tiles and basemaps	Mapbox Studio	10 %
Lab 3	Data generation	QGIS & OpenStreetMap	10 %
Lab 4	Joins and polygons	Leaflet & QGIS	10 %

Lab 5	Density maps	Carto	15 %
Lab 6	Working with social media data	<i>TBA</i>	10 %

Reading

The technical material covered by this course remains relatively new, and there is no textbook that offers good coverage of the course material in an appropriate style. Perhaps the closest to complete coverage of the class material is provided by

Peterson, M. 2014 *Mapping in the Cloud*. Guilford Press, New York.

An e-copy (3 simultaneous readers only) is available through the library. However, I will also provide key chapters via the bCourses site for the class.

There are many other relevant materials, both in books, the research literature, and online. These will be linked from lecture slides (available online as noted above), and where possible, provided via *bCourses*.

Assessment

Course assessment consists of 65% across the 6 lab assignments (NOT equally allocated, see the list of lab assignments above), 13% on the midterm, 20% on the final exam and 2% for attendance at the first lab sessions in the week of August 29.

Details of the assessment criteria for each lab assignment will be made clear in the associated assignment materials.

The midterm will be run in class and will consist of short answer questions on materials covered in the first half of the semester.

The final exam will be 90-120 minutes (TBC) and will consist of some short answers, and one longer answer question.

University Policies

Academic Integrity

Any test, paper or report submitted by you and that bears your name is presumed to be your own original work that has not previously been submitted for credit in another course unless you obtain prior written approval to do so from your instructor.

In all of your assignments, including your homework or drafts of papers, you may use words or ideas written by other individuals in publications, web sites, or other sources, but only with proper attribution. "Proper attribution" means that you have fully identified the original source and extent of your use of the words or ideas of others that you reproduce in your work for this course, usually in the form of a footnote or parenthesis.

As a general rule, if you are citing from a published source or from a web site and the quotation is short (up to a sentence or two) place it in quotation marks; if you employ a longer passage from a publication

or website, please indent it and use single spacing. In both cases, be sure to cite the original source in a footnote or in parentheses.

If you are not clear about the expectations for completing an assignment or taking a test or examination, be sure to seek clarification from your instructor or GSI beforehand.

Finally, you should keep in mind that as a member of the campus community, you are expected to demonstrate integrity in all of your academic endeavors and will be evaluated on your own merits. So be proud of your academic accomplishments and help to protect and promote academic integrity at Berkeley. The consequences of cheating and academic dishonesty—including a formal discipline file, possible loss of future internship, scholarship, or employment opportunities, and denial of admission to graduate school—are simply not worth it.

In fairness to students who put in an honest effort, cheaters will be harshly treated. Any evidence of cheating will result in a score of zero (0) on that assignment or examination. Cheating on the final exam results in an "F" for the course. Cheating includes but is not limited to bringing notes or written or electronic materials into an exam or quiz, using notes or written or electronic materials during an exam or quiz, copying off another person's exam or quiz, allowing someone to copy off of your exam or quiz, and having someone take an exam or quiz for you. Incidences of cheating will be reported to Student Judicial Affairs, which may administer additional punishment.

Accommodation of religious creed

In compliance with Education code, Section 92640(a), it is the official policy of the University of California, Berkeley to permit any student to undergo a test or examination, without penalty, at a time when that activity would not violate the student's religious creed, unless administering the examination at an alternative time would impose an undue hardship that could not reasonably have been avoided. Requests to accommodate a student's religious creed by scheduling tests or examinations at alternative times should be submitted directly to the faculty member responsible for administering the examination by the second week of the semester.

Reasonable common sense, judgment and the pursuit of mutual goodwill should result in the positive resolution of scheduling conflicts. The regular campus appeals process applies if a mutually satisfactory arrangement cannot be achieved.

The link to this policy is available in the [Religious Creed](#) section of the Academic Calendar webpage.

Conflicts between extracurricular activities and academic requirements

The Academic Senate has established Guidelines Concerning Scheduling Conflicts with Academic Requirements to address the issue of conflicts that arise between extracurricular activities and academic requirements. These policies specifically concern the schedules of student athletes, student musicians, those with out-of-town interviews, and other students with activities (e.g., classes missed as the result of religious holy days) that compete with academic obligations.

These policies were updated in Spring 2014 to include the following statement:

-The pedagogical needs of the class are the key criteria when deciding whether a proposed accommodation is appropriate. Faculty must clearly articulate the specific pedagogical reasons that prevent accepting a proposed accommodation. Absent such a reason, the presumption should be that accommodations are to be made.

The guidelines assign responsibilities as follows:

-It is the instructor's responsibility to give students a schedule, available on the syllabus in the first week of instruction, of all class sessions, exams, tests, project deadlines, field trips, and any other required class activities.

-It is the student's responsibility to notify the instructor(s) in writing by the second week of the semester of any potential conflict(s) and to recommend a solution, with the understanding that an earlier deadline or date of examination may be the most practicable solution.

-It is the student's responsibility to inform him/herself about material missed because of an absence, whether or not he/she has been formally excused.

The [complete guidelines](#) are available on the Academic Senate website. Additionally, a [checklist](#) to help instructors and students comply with the guidelines is available on the Center for Teaching and Learning website.

Absences due to illness

Instructors are asked to refrain from general requirements for written excuses from medical personnel for absence due to illness. Many healthy people experience a mild-to-moderate illness and recover without the need to seek medical attention. University Health Services does not have the capacity to evaluate such illnesses and provide documentation excusing student absences. However, UHS will continue to provide documentation when a student is being treated by Tang for an illness that necessitates a change in course load or an incomplete.

From time-to-time the Academic Senate has issued guidance concerning missed classes and exams due to illnesses such as influenza advising that students not attend class if they have a fever. Should a student experience repeated absences due to illness, it may be appropriate for the faculty member to ask the student to seek medical advice. The Senate guidelines advise faculty to use flexibility and good judgment in determining whether to excuse missed work, extend deadlines, or substitute an alternative assignment. Only the Committee on Courses of Instruction (COCI) can waive the final exam. However, a department chair can authorize an instructor to offer an alternative format for a final exam (e.g., paper, take-home exam) on a one-time basis (<http://academic-senate.berkeley.edu/committees/coci/toolbox#16>).