



Course Syllabus

[Jump to Today](#)

GEOG 260 Geographic Information in a Changing World: Introduction to GIScience – Fall 2021

Instructor	Manzhu Yu <mgy5198@psu.edu>, Assistant Professor of Geography Office hour: Wednesdays 1 PM - 2 PM. On Zoom: https://psu.zoom.us/j/5147894821  (https://psu.zoom.us/j/5147894821)
Teaching Assistant	Lilly Zeitler <lmz5288@psu.edu>, Ph.D. student, Department of Geography Office hour: Thursdays 2:15 - 3:15 PM. Either on Zoom: https://psu.zoom.us/j/5540105669  (https://psu.zoom.us/j/5540105669) or in-person at 331 Walker or 208 Walker
Lectures	<ul style="list-style-type: none">• Mondays 1:25PM - 2:15PM. Henderson Bldg 117. In-person.• 50 mins web contents In person. Walker 208.
Labs	Section 001: Fr 1:25PM - 3:20PM Section 002: Tu 8:00AM - 9:55AM Section 003: Th 3:35PM - 5:30PM

This is a hybrid course; participation is required for both in-person and online portions.

Course Overview:

In a rapidly changing world, detailed, up-to-date geographic data are indispensable in governance, commerce, security, public health, and many other domains. These data are also needed to support research intended to improve our understanding of social and environmental systems. Making data useful in these domains requires methods and tools that transform data to information and that make that information accessible where and when it is needed.

Geographic data specify the locations and characteristics of people, and objects both natural and anthropogenic in nature. Geographic data are produced by several formal methods, including land surveying, aerial photography and photogrammetry, satellite remote sensing and positioning systems, and social surveys such as those conducted by the U.S. Census Bureau. They also are derived through informal methods that rely on the vast and growing array of location-enabled devices including cell phones, smart watches, credit card transaction records, and RFID tags on packages, along with volunteers compiling input to projects such as the Open Street Map.

Geographic information systems (GIS) and related technologies are used to turn those data into the information people need to make informed decisions. Maps and related graphics generated on a wide array of devices from cell phones to large touch-screen displays then make the information more accessible and by doing so enable those decisions. Geographic Information Science (GIScience) is concerned with the design, development, and use of geographic information and technologies (also called geospatial technologies) to help institutions and individuals respond to, and ideally to predict, environmental and social change. This course provides a broad, practical foundation of Geographic Information Science

methods and technologies for aspiring Geography majors and students pursuing the Geographic Information Science minor or undergraduate certificate.

(Optional) Textbook

GIS Fundamentals: A First Text on Geographic Information Systems, 6th Edition, Paul Bolstad.

Assistance with Textbooks

Penn State honors and values the socioeconomic diversity of our students. If you require assistance with the costs of textbooks for this course, contact the Office of Student Care and Advocacy (120 Boucke Building, 863-4926, <http://studentaffairs.psu.edu/studentcare>). For additional need related to socioeconomic status please visit <http://sites.psu.edu/projectcahir>.

Course Objectives

After the course, students will be prepared to demonstrate:

- Self-knowledge of their individual strengths and weakness in relation to the foundational, academic, and industry-specific competencies specified in the U.S. Department of Labor's Geospatial Technology Competency Model (GTCM).
- Familiarity with key topics that span the three industry sectors of the GTCM.
- Lifelong learning skills, including the ability to investigate topics independently, the ability to work in teams, and the ability to communicate effectively.
- The ability to use maps and geospatial technology as a story-telling medium.
- Knowledge of geospatial and attribute data structure and sources.

Course Prerequisite

There is no prerequisite for Geog 260.

Recommended Preparations: Completion of a basic rhetoric and composition course (ENGL 15 or 30 or 137; or CAS 137; or ESL 15) OR completion of College of Earth and Mineral Sciences First-Year Seminar EMSC 100.

Related Courses

This course will replace GEOG 160 as the entry-level prerequisite for higher-level Geographic Information Science courses (GEOG 361, 362, 363, 365: cartography, remote sensing, GIS, and programming).

Students who have earned a C or higher in GEOG 160 should NOT take GEOG 260, but rather go directly into the 36x courses.

Grade components:

Assignment details will be available on Canvas. Due dates can be found on the Course Schedule, also posted in Canvas.

- Discussion posts & responses(30%). This course relies, in part, on student-centered pedagogical methods, which seek to put the students in control of their learning. To that end, you will be required to respond to **two** discussion topics, every other week, which will address the topic of the lecture for that week. During the alternative week, you will need to respond to **at least two** of your fellow students' posts. This will allow us to dynamically learn from each other, in addition to the course material, every week. Discussion posts and questions will be **due by 11:59pm each Sunday**. More detailed instructions on this requirement are posted on Canvas, and if you have any questions about the discussion posts themselves, please post them as a comment in the "Questions" discussion page.

- Lab Assignments(30%). You will attend a lab session each week via Zoom (in Canvas) that will be led by your TA, Lilly Zeitler. Lab assignments will be due by 11:59pm on the day before your next lab session each week, e.g., for Tuesday labs, your assignment will be due the following Monday; for Thursday labs, the following Wednesday, and for Friday labs, the following Thursday.
- Quizzes(20%). There will be five quizzes during the course of the semester to assess your progress in the course. The quizzes will be brief, mostly in short answer format, and you will have approximately 15-20 minutes to complete them during class.
- Final research project(20%). You will be expected to conduct a research project that involves building a **StoryMap in ArcGIS**, which incorporates **some form of original applied research**, i.e., something you created rather than borrowed & cited. For example, you may choose to do a new analysis of existing data in ArcGIS or ArcPro, conduct an online survey, qualitative interviews or field work, collect spatial imagery or GPS data, etc. You may choose to work alone or in groups of up to three for this project. An appropriate level of effort given your group size will need to be reflected in the scale of the project.

The final projects will be a good way to showcase what you have learned over the semester. They will be due on **12/13**. You will then need to review your peers' StoryMaps and provide comment on at least two by **12/15**. There will not be a final exam, so this will conclude your responsibilities for this course.

Grading:

Grades are calculated using this set scale:

- | | | |
|--------------|--------------|--------------------|
| • A: 93-100% | • B: 83-86% | • C: 70-76% |
| • A-: 90-92% | • B-: 80-82% | • D: 60-69% |
| • B+: 87-89% | • C+: 77-79% | • F: less than 60% |

Exam Policy

There are seven tests in the course: six quizzes and one cumulative final exam. If you need to miss a test, please request permission to take a **makeup test** before the test date. An alternative test will be provided for you that is different from the in-class test.

Attendance Policy

Attendance is recorded during lectures and labs and participation is expected in both.

Deadlines

An assignment submitted **late will be penalized by a one-point deduction**, and late submissions will not be accepted one week past their original due date. **Zero points for an assignment late by more than one week.**

Lab projects are to be submitted by 11:59pm the day prior to the lab session in the week in which they are due. Online discussion posts and responses are to be submitted each Sunday by 11:59pm. Refer to the course calendar in Canvas for due dates.

There are no options for extra credit offered for the course. If you complete your assignments conscientiously and on time, and prepare for quizzes, you should do well in this course.

Continued Fine Print

This course abides by the Penn State Attendance Policy E-11: <http://undergrad.psu.edu/aappm/E-11-class-attendance.html> and Conflict Exam Policy 44-35: <http://senate.psu.edu/policies-and-rules-for-undergraduate-students/44-00-examinations/#4435>. Please also see Illness Verification Policy: <http://studentaffairs.psu.edu/health/welcome/illnessVerification/>, and Religious Observance Policy: <http://undergrad.psu.edu/aappm/R-4-religious-observances.html>. Students who miss class for legitimate reasons will be given a reasonable opportunity to make up missed work, including exams and quizzes. Students are not required to secure the signature of medical personnel in the case of illness or injury and should use their best judgment on whether they are well enough to attend class or not; the University Health Center will not provide medical verification for minor illnesses or injuries. Other legitimate reasons for missing class include religious observance, military service, family emergencies, regularly scheduled university-approved curricular or extracurricular activities, and post-graduate, career-related interviews when there is no opportunity for students to re-schedule these opportunities (such as employment and graduate school final interviews). Students who encounter serious family, health, or personal situations that result in extended absences should contact the Office of the Assistant Vice President for Student Affairs (AVPSA) and Student Care and Advocacy for help. Whenever possible, students participating in University-approved activities should submit to the instructor a Class Absence Form available from the Registrar's

Office: http://www.registrar.psu.edu/student_forms/ at least one week prior to the activity.

Academic Integrity

This course follows the Penn State defines academic integrity as "the pursuit of scholarly activity in an open, honest and responsible manner." Academic integrity includes "a commitment not to engage in or tolerate acts of falsification, misrepresentation, or deception." In particular, the University defines plagiarism as "the fabrication of information and citations; submitting other's work from professional journals, books, articles, and papers; submission of other student's papers, lab results or project reports and representing the work as one's own." Penalties for violations of academic integrity may include course failure. To learn more, see Penn State's tutorial at <http://academicintegrity.psu.edu/>

Course Copyright

All course materials students receive or to which students have online access are protected by copyright laws. Students may use course materials and make copies for their own use as needed, but unauthorized distribution and/or uploading of materials without the instructor's express permission is strictly prohibited. University Policy AD 40, the University Policy Recording of Classroom Activities and Note Taking Services addresses this issue. Students who engage in the unauthorized distribution of copyrighted materials may be held in violation of the University's Code of Conduct, and/or liable under Federal and State laws.

For example, uploading completed labs, homework, or other assignments to any study site constitutes a violation of this policy.

Accommodations for Students with Disabilities

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Student Disability Resources (SDR) website provides contact information for every Penn State campus: (<http://equity.psu.edu/student-disability-resources/disability-coordinator>) (<http://equity.psu.edu/student-disability-resources/disability-coordinator>) (<http://equity.psu.edu/student-disability-resources/disability-coordinator>). For further information, please visit the Student Disability Resources website (<http://equity.psu.edu/student-disability-resources>) (<http://equity.psu.edu/student-disability-resources>) (<http://equity.psu.edu/student-disability-resources>).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation: (<http://equity.psu.edu/student-disability-resources/applying-for-services>) (<http://equity.psu.edu/student-disability-resources/applying-for-services>) (<http://equity.psu.edu/student-disability-resources/applying-for-services>). If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

Weather Delays

Campus emergencies, including weather delays, are announced on [n](http://news.psu.edu/) (<http://news.psu.edu/>) **Penn State News** (<http://news.psu.edu/>) **a** (<http://news.psu.edu/>) and communicated to cell phones, email, the Penn State Facebook page, and Twitter via PSUAlert (**Sign up at:** <https://psualert.psu.edu/psualert/>) (<https://psualert.psu.edu/psualert/>) (<https://psualert.psu.edu/psualert/>).

Reporting Bias-Motivated Incidents

Penn State takes great pride to foster a diverse and inclusive environment for students, faculty, and staff. Acts of intolerance, discrimination, or harassment due to age, ancestry, color, disability, gender, gender identity, national origin, race, religious belief, sexual orientation, or veteran status are not tolerated (<https://policy.psu.edu/policies/ad29>) (<https://policy.psu.edu/policies/ad29>) (<https://policy.psu.edu/policies/ad29>) and can be reported through Educational Equity via the [e](http://equity.psu.edu/reportbias/) (<http://equity.psu.edu/reportbias/>) **Report Bias webpage** (<http://equity.psu.edu/reportbias/>) (<http://equity.psu.edu/reportbias/>).

Counseling and Psychological Services

Many students at Penn State face personal challenges or have psychological needs that may interfere with their academic progress, social development, or emotional wellbeing. The university offers a variety of confidential services to help you through difficult times, including individual and group counseling, crisis intervention, consultations, online chats, and mental health screenings. These services are provided by staff who welcome all students and embrace a philosophy respectful of clients' cultural and religious backgrounds, and sensitive to differences in race, ability, gender identity and sexual orientation. Services include the following:

Counseling and Psychological Services at University Park (CAPS) (<http://studentaffairs.psu.edu/counseling/>): (<http://studentaffairs.psu.edu/counseling/>) 814-863-0395

Penn State Crisis Line (24 hours/7 days/week): 877-229-6400

Crisis Text Line (24 hours/7 days/week): Text LIONS to 741741

Penn State E-mail Accounts

All official communications from Penn State are sent to students' Penn State e-mail accounts. Be sure to check your Penn State account regularly, or forward your Penn State e-mail (see [e !\[\]\(5eb1325dfdc3f1cad8426726c0db51cd_img.jpg\) \(http://kb.its.psu.edu/node/2303\)](http://kb.its.psu.edu/node/2303) <http://kb.its.psu.edu/node/2303> [e !\[\]\(312638b5686dbc3f6ff8424fd17b3fb2_img.jpg\) \(http://kb.its.psu.edu/node/2303\)](http://kb.its.psu.edu/node/2303) [e !\[\]\(88e39a015d99d67943a7ca963c140a17_img.jpg\) \(http://kb.its.psu.edu/node/2303\)](http://kb.its.psu.edu/node/2303) to your preferred e-mail account, so you don't miss any important information.

Deferred Grades

If you are prevented from completing this course within the prescribed amount of time, it is possible to have the grade deferred with the concurrence of the instructor. To seek a deferred grade, you must submit a written request (by e-mail or U.S. post) to your instructor describing the reason(s) for the request. It is up to your instructor to determine whether or not you will be permitted to receive a deferred grade. If, for any reason, the course work for the deferred grade is not complete by the assigned time, a grade of "F" will be automatically entered on your transcript.

Military Personnel

Veterans and currently serving military personnel and/or spouses with unique circumstances (e.g., upcoming deployments, drill/duty requirements, disabilities, VA appointments, etc.) are welcome and encouraged to communicate these, in advance if possible, to the instructor in the case that special arrangements need to be made.

Technical Requirements

For this course, we recommend the minimum technical requirements outlined on the Dutton Institute Technical Requirements page (<https://www.e-education.psu.edu/techspecs> [e !\[\]\(e1d6102fe77919492c04879c8450f1f5_img.jpg\) \(https://www.e-education.psu.edu/techspecs\)](https://www.e-education.psu.edu/techspecs) [e !\[\]\(f18214e08965a1644d0b2b0878fd365f_img.jpg\) \(https://www.e-education.psu.edu/techspecs\)](https://www.e-education.psu.edu/techspecs)), including the requirements listed for same-time, synchronous communications. If you need technical assistance at any point during the course, please contact the ITS Help Desk (<http://itservicedesk.psu.edu/> <http://itservicedesk.psu.edu> [e !\[\]\(13e6312e8a91f638138e1e4097906993_img.jpg\) \(http://itservicedesk.psu.edu/\)](http://itservicedesk.psu.edu/) [e !\[\]\(1dc047d1472e30f6a716de594b729546_img.jpg\) \(http://itservicedesk.psu.edu/\)](http://itservicedesk.psu.edu/)).

Netiquette

The term "Netiquette" refers to the etiquette guidelines for electronic communications, such as e-mail and bulletin board postings. Netiquette covers not only rules to maintain civility in discussions, but also special guidelines unique to the electronic nature of forum messages. Please review some [e !\[\]\(d5d7044e5caf6907399af2dced8d6ff8_img.jpg\) \(http://facdev.e-education.psu.edu/node/271\)](http://facdev.e-education.psu.edu/node/271) [general !\[\]\(0718ece108875f096be32ef1aea65831_img.jpg\) Netiquette guidelines](http://facdev.e-education.psu.edu/node/271) [e !\[\]\(5413432958edc783e108af585cf114e8_img.jpg\) \(http://facdev.e-education.psu.edu/node/271\)](http://facdev.e-education.psu.edu/node/271) [t !\[\]\(ce29a2ea9900b5306b05013aca84b96c_img.jpg\) \(http://facdev.e-education.psu.edu/node/271\)](http://facdev.e-education.psu.edu/node/271) that should be followed when communicating in this course.

Disruptive Behavior

Behavior that disrupts normal classroom activities will not be tolerated, in accordance with Items 9 and 14 in the [e !\[\]\(ab4e2b3fc7e7887b7a72f548aa6f5e60_img.jpg\) \(http://studentaffairs.psu.edu/conduct/Procedures.shtml\)](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [Student Code](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [e !\[\]\(0a20d1259d5ab849a22cc9906b421113_img.jpg\) \(http://studentaffairs.psu.edu/conduct/Procedures.shtml\)](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [e !\[\]\(7aa29892bff760d52365d7f4c0908c26_img.jpg\) \(http://studentaffairs.psu.edu/conduct/Procedures.shtml\)](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [of !\[\]\(5c1b64962792396e8fbc2d4fb35c2fdb_img.jpg\) Conduct](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [e !\[\]\(2fcd7569af249233d6cf78ae7a1b6845_img.jpg\) \(http://studentaffairs.psu.edu/conduct/Procedures.shtml\)](http://studentaffairs.psu.edu/conduct/Procedures.shtml) [e !\[\]\(556d800995a5c13f157bc50b1aa5d19d_img.jpg\) \(http://studentaffairs.psu.edu/conduct/Procedures.shtml\)](http://studentaffairs.psu.edu/conduct/Procedures.shtml).

Safety

In the case of an emergency, we will follow the College of Earth and Mineral Sciences Critical Incident Plan

(https://www.ems.psu.edu/sites/default/files/documents/faculty_staff/cip_fall_2018-spring_2019.pdf). In the event of an evacuation, we will follow posted evacuation routes and gather at the Designated Meeting Site. Evacuation routes for all EMS buildings are available at <http://www.ems.psu.edu/resources-faculty-and-staff/safety-and-emergency-information> [↗](http://www.ems.psu.edu/resources-faculty-and-staff/safety-and-emergency-information) [↗](http://www.ems.psu.edu/resources-faculty-and-staff/safety-and-emergency-information) For more information regarding actions to take during particular emergencies, please see the [e ↗ \(http://police.psu.edu/emergency-action-guides\)](http://police.psu.edu/emergency-action-guides) [↗](http://police.psu.edu/emergency-action-guides) Penn State Emergency Action Guides [↗](http://police.psu.edu/emergency-action-guides) [↗](http://police.psu.edu/emergency-action-guides) [↗](http://police.psu.edu/emergency-action-guides)

Mandated Reporting Statement

Penn State's policies require me, as a faculty member, to share information about incidents of sex-based discrimination and harassment (discrimination, harassment, sexual harassment, sexual misconduct, dating violence, domestic violence, stalking, and retaliation) with Penn State's Title IX coordinator or deputy coordinators, regardless of whether the incidents are stated to me in person or shared by students as part of their coursework. For more information regarding the University's policies and procedures for responding to reports of sexual or gender-based harassment or misconduct, please visit Penn State's [s ↗ \(http://titleix.psu.edu/\)](http://titleix.psu.edu/) Office of [↗ \(http://titleix.psu.edu/\)](http://titleix.psu.edu/) [↗ \(http://titleix.psu.edu/\)](http://titleix.psu.edu/) Sexual Misconduct and Prevention & Response [↗ \(http://titleix.psu.edu/\)](http://titleix.psu.edu/) w [↗ \(http://titleix.psu.edu/\)](http://titleix.psu.edu/) ebsite.

Additionally, I am required to make a report on any reasonable suspicion of child abuse in accordance with the [e ↗ \(http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM\)](http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM) Pennsylvania [↗ \(http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM\)](http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM) [↗ \(http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM\)](http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM) Child Protective Services Law [↗ \(http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM\)](http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM) [↗ \(http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM\)](http://www.legis.state.pa.us/WU01/LI/LI/CT/HTM/23/00.063..HTM)

Diversity, Inclusion, and Respect

Penn State is "committed to creating an educational environment which is free from intolerance directed toward individuals or groups and strives to create and maintain an environment that fosters respect for others" as stated in Policy AD29 Statement on Intolerance. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment and to interact with civility.

Disclaimer Statement

Please note that the specifics of this Course Syllabus can be changed at any time, and you will be responsible for abiding by any such changes. Changes to the syllabus shall also be given to the student in written (paper or electronic) form.

Course Summary:

Date	Details	Due
Wed Aug 25, 2021	Discussion Post #1: Self-Intro (https://psu.instructure.com/courses/2120243/assignments/13163495)	due by 11:59pm
Fri Aug 27, 2021	Discussion Response #1: Self-Intro (https://psu.instructure.com/courses/2120243/assignments/13163547)	due by 11:59pm
Sun Sep 5, 2021	Discussion Post #2: GIS fundamentals and Data Models	due by 11:59pm

Tentative Course Schedule:

* This is a tentative schedule, check up-to-date version through Canvas.

Week	Lecture Topic	Lab	Due
1. Aug 23	Introduction	No lab	Discussion #1 Post & Response
2. Aug 30	Lesson 1: GIS Fundamentals & Data model	Lab01: ArcGIS Online Self-introduction	Discussion #2 Post
3. Sep 6	Labor Day – no class	No lab	Discussion #2 Response Lab01
4. Sep 13	Instructor presenting at NOAA AI workshop – no class	Lab02: Digitizing data with Google Geo tools	
5. Sep 20	Discussion & Quiz 1	No lab	Lab02
6. Sep 27	Lesson 2: Geodesy & Projections	Lab03: Playing with map projections	Discussion #3 Post
7. Oct 4	Discussion & Quiz 2	Lab04: Intro to ArcGIS Pro	Discussion #3 Response Lab03
8. Oct 11	Lesson 3: Cartography & Visualization	Lab05: Choropleth Maps using Census Data	Discussion #4 Post Lab04
9. Oct 18	Discussion & Quiz 3	Lab06: Intro to ESRI StoryMaps	Discussion #4 Response Lab05
10. Oct 25	Lesson 4: Geospatial Data	Lab07: Generating Shapefiles & Creating a 3D scene	Discussion #5 Post Lab06
11. Nov 1	Discussion & Quiz 4	Lab08: Final project proposal	Discussion #5 Response Lab07
12. Nov 8	Lesson 5: Spatial Analysis	Lab09: PASDA, Density & Proximity	Discussion #6 Post Lab08
13. Nov 15	Discussion & Quiz 5	Work on final project	Discussion #6 Response Lab09
14. Nov 22	Thanksgiving Holiday – no class	No lab	
15. Nov 29	Lesson 6: Programming & Web GIS	Work on final project	Discussion #7 Post
16. Dec 6	Discussion & Wrap-up	Work on final project	Discussion #7 Response
Conclusion of the course. No exam. <i>Final project due Dec 13.</i>			