

# E&ES 271: MAPPING THE PANDEMIC | WINTER SESSION 2021

Crosslisted with QAC 232

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Class meetings: January 4 – 8, 11 – 18; 9:30 – 11:00 am, noon – 2:00 pm | Office hours: by appt

## COURSE DESCRIPTION

The COVID-19 pandemic has altered the global community's daily relationship with space and movement, both at a hyperlocal scale of social distancing to a global scale of disease spread. Spatiotemporal visualizations in the form of maps and apps have allowed us to watch the worldwide spread of COVID-19 and keep tabs on local case counts in our own spaces. Furthermore, individuals use geoenabled apps to alert businesses that they are nearing the merchandise pick-up destination (e.g. curbside pickup), to find COVID-19 testing locations, to find uncrowded outdoor spaces (e.g. parks and hiking trails), and so on. Delivery services (e.g. Amazon) use navigation networks to efficiently deliver goods to homes and businesses. Public health organizations map the number of available medical resources (e.g. open beds, respirators) per hospital and region. Researchers create spatial maps and models of indoor air flow of pathogen-laden air, social justice issues related to the pandemic (e.g. racial and policing tensions in the US), changes in air quality due to decreased automobile commuting during lockdown, and so on. Understanding spatiotemporal patterns in population growth, migration, urbanization, globalization of travel and trade, food production (especially industrial livestock production), widening socioeconomic disparity, habitat encroachment, and climate change also allow researchers to examine the emergence of global infectious disease pathogens. In short, geographic information systems (GIS) provide citizens, researchers, health care providers, and policy makers with a powerful analytical framework for visualization, data exploration, spatial pattern recognition, response planning, and decision making within our life in the time of COVID-19.

This course is designed to develop spatial thinking and visualization skills relevant to COVID-19. Students will look at (and critically evaluate) existing maps and apps related to the current pandemic, create their own maps and apps, and critically evaluate their classmates' maps and apps. Class meetings will consist of case study lectures/discussions, instructor-led skill-building workshops, studio work sessions, and presentation/critique sessions. Spatial data collection, management, analysis, and visualization will occur within a cloud-based GIS (ArcGIS Online). Readings prior to the first class will establish a baseline for student comprehension of the breadth of applied geospatial thinking in today's research arena. The course is aimed at students with limited or no prior GIS experience.

## Learning Outcomes

- Students will become sensitized to the spatiality of the world.
- Students will gain a sufficient conceptual and applied understanding of key components of a GIS (data acquisition and preparation, data manipulation and spatial analysis, and output generation) to generate a GIS from scratch.
- Students will learn how to critically evaluate map effectiveness in the mass media.
- Students will reflect on how maps can shape environmental and social issues as well as reflect on the implications of GIS output as related to COVID-19.

## REQUIREMENTS

### Technology

The course necessitates a computer (PC or Mac) with an internet connection.

### Readings

Rather than a traditional textbook, readings will consist of maps, journal articles, and story maps.

### Work Evaluation

Critiques / presentations / participation: **10%**. Students must attend and participate in class sessions. Students are expected to arrive on time. Anticipated absences should be discussed with the instructor as unexcused absences will result in a lowered grade. Each student will lead critiques of existing COVID-19 related maps and present their own work.

Assignments: **75%**. Assignments involve a series of hands-on lessons designed to teach students (1) how to recreate existing COVID-19 related geo-enabled apps and (2) how to find data and use analyses to create their own maps and apps. The final assignment is an original COVID-19 related geo-enabled app. Assignments are not weighted equally.

Lab notebook and report: **15%**. Students must keep a detailed log of data sources, analyses, and tools / apps used for their original geo-enabled app as well as a written report providing an overview and rationale, data and methods, and conclusion.

### Work Submission

Anticipate the length of time necessary to complete assignments. Due to the intense nature of the short winter session and the rapid building of skills, late work is not accepted.

### Time Commitment

While the exact time commitment for the class will vary individually and daily, I recommend that you budget approximately three out-of-class hours for every class hour. That time is needed for skill building, creative project development, assignment revision, and experimentation of tools/apps/symbology.

### Responsible Behavior

Maintain respect for your instructor and your peers throughout the semester. Critiques should provide constructive criticism in an encouraging and supportive manner.

Keep your video on during class meetings (except for live studio time). Make your preferred name visible on Zoom. Do not record class sessions (neither online nor in-person) without my authorization. Do not distribute course materials to persons/entities not enrolled in the course.

Students and faculty each have responsibility for maintaining an appropriate learning environment. Those who fail to adhere to such behavioral standards may be subject to discipline. Professional courtesy and sensitivity are especially important with respect to individuals and topics dealing with differences of race, color, culture, religion, creed, politics, veteran's status, sexual orientation, gender, gender identity and gender expression, age, ability, and nationality. Class rosters are provided to the instructor with the student's legal name. I will gladly honor your request to address you by an alternate name or gender pronoun. Please advise me of this preference early in the semester so that I may make appropriate changes to my records. For more information, see the policies on [the student code](#).

## SCHEDULE

### Before Class Begins

Skim: *What is GIS?* <https://www.esri.com/en-us/what-is-gis/overview>

Do: the lesson at <https://learn.arcgis.com/en/projects/the-power-of-maps/>

Read: *Mapping Coronavirus Responsibly* at <https://www.esri.com/arcgis-blog/products/product/mapping/mapping-coronavirus-responsibly/>

Read and explore: *COVID-19: The First Global Pandemic of the Information Age* at <https://storymaps.arcgis.com/stories/a5190c7fd6db422f9a1bab6dac024b99>

Explore: a COVID-19 app created by a Wesleyan professor and students (<https://arcg.is/0mvWPT>)

Write: a critique of the Wesleyan-created COVID-19 geo-enabled app and/or maps within the story map

### January 4 | Day One

**Morning:** Welcome, syllabus review, Pre-Session Assignments discussion

**Afternoon:** Introduction to ArcGIS Online; exploring relevant (and available) data

**Assignment:** Map critique

### January 5 | Day Two

**Morning:** Mapping the spread of disease

**Afternoon:** work session

**Assignment:** Assignment 1

### January 6 | Day Three

**Morning:** Data classification and symbology, student map critique presentations

**Afternoon:** work session

**Assignment:** Assignment 2

### January 7 | Day Four

**Morning:** Data analysis (geoprocessing), student map critique presentations

**Afternoon:** work session

**Assignment:** Assignment 3

### January 8 | Day Five

**Morning:** Spatial statistics

**Afternoon:** work session, student map critique presentations

**Assignment:** Assignment 4

### January 11 | Day Six

**Morning:** Modeling trends

**Afternoon:** work session, student map critique presentations

**Assignment:** Assignment 5

### January 12 | Day Seven

**Morning:** Incorporating proximity analysis

**Afternoon:** work session, student map critique presentations

**Assignment:** Assignment 6

January 13 | Day Eight

**Morning:** Putting it all together (in a dashboard)

**Afternoon:** work session, student map critique presentations

**Assignment:** Assignment 7

January 14 | Day Nine

**Morning:** Putting it all together (in a story map or an experience)

**Afternoon:** work session, student map critique presentations

**Assignment:** Assignment 8; Introduce Final Assignment

January 15 | Day Ten

**Morning:** Oh, the things you can do! But there's more with ArcGIS Pro...

**Afternoon:** work session, student map critique presentations

January 18 | Day Eleven

**Morning:** Final assignment presentations and critiques

**Afternoon:** work session

January 19 | Reading Day

January 20 | Winter Short Session Examinations

Final assignment and write-ups due

## IMPORTANT NOTES

### Tips for Success

Everyone works and learns at different speeds. Frustration is common among new GIS users. Keep the following in mind throughout the semester:

- Reading is fundamental – follow directions carefully.
- Save early and often! (And get into the habit of backing up your work.)
- Practice makes perfect (but takes a long time).
- Be patient. (Don't hit the same button more than once – give the computer time to process.)

I encourage you to use the ArcGIS help features before asking for assistance. If you are still stuck, do not be shy about asking me questions.

### Academic Integrity

Learning is a collaborative endeavor—most of us learn better when we work in cooperation with other people to master new or difficult ideas. You may consult with classmates to solve software problems and discuss issues regarding data sources and map designs. (However, assignments themselves must be completed individually.) If you find new or more efficient methods, share what you learn with the class.

Academic honesty is always expected. A zero score will be assigned to any submission on which a student commits academic dishonesty. Any violation will be reported to the University. If you have questions

about what constitutes plagiarism and academic dishonesty, please review the [Honor Code](#) section of your Student Handbook. All students of Wesleyan University are responsible for knowing and adhering to the [Honor Code](#) of this institution. Violations of this policy may include: cheating, plagiarism, aid of academic dishonesty, fabrication, lying, bribery, and threatening behavior. All incidents of academic misconduct shall be reported to the Honor Code Council – Office of Student Affairs. Students who are found to be in violation of the academic integrity policy will be subject to both academic sanctions from the faculty member and non-academic sanctions (including but not limited to university probation, suspension, or expulsion). The [Office of Student Affairs](#) has more information.

### Academic Resources

For information about campus computing facilities, library resources, writing assistance, quantitative data analysis assistance, and technology assistance, visit <http://www.wesleyan.edu/sar/>. See also <https://www.wesleyan.edu/academics/journey/advising-students.html>.

### Accommodation Statement

University is committed to ensuring that all qualified students with disabilities are afforded an equal opportunity to participate in, and benefit from, its programs and services. To receive accommodations, a student must have a disability as defined by the ADA. Since accommodations may require early planning and generally are not provided retroactively, please contact Accessibility Services as soon as possible. If you have a disability, or think that you might have a disability, please contact [Accessibility Services](#) in order to arrange an appointment to discuss your needs and the process for requesting accommodations. Accessibility Services is located in North College, rooms 021/218, or can be reached by email ([accessibility@wesleyan.edu](mailto:accessibility@wesleyan.edu)) or phone (860-685-2332). If you require accommodations in this course, please make an appointment with me as soon as possible to make appropriate arrangements.

### Religious/Spiritual Observance Resources

Faculty make every effort to deal reasonably and fairly with all students who, because of religious obligations, have conflicts with scheduled exams, assignments, or required assignments/attendance. If this applies to you, please speak with me directly as soon as possible at the beginning of the term. Should you require additional support or guidance, please feel free to reach out to Rabbi David Teva, Director of the Office of Religious and Spiritual Life at [dleipziger@wesleyan.edu](mailto:dleipziger@wesleyan.edu) or any of the chaplains in the Office of Religious and Spiritual Life at <https://www.wesleyan.edu/orsl/index.html>. For a list of a religious holidays celebrated by members of the Wesleyan community, go to Wesleyan’s Multifaith calendar which can be found at: <https://www.wesleyan.edu/orsl/multifaith-calendar.html>.

### Discrimination and Harassment

Wesleyan University is committed to maintaining a positive learning, working, and living environment. Wesleyan will not tolerate acts of discrimination or harassment based upon Protected Classes or related retaliation against or by any employee or student. For purposes of this Wesleyan policy, “Protected Classes” refers to race, color, national origin, sex, pregnancy, age, disability, creed, religion, sexual orientation, gender identity, gender expression, veteran status, political affiliation or political philosophy. Individuals who believe they have been discriminated against should contact [the Office for Equity and Inclusion](#) at 860-685-4771. The [responsibility of the University Members](#) has more information.