RUTGERS
School of Public Health

Course Title: GIS in Public Health

Course Number: EPID 0641J - 033

Course Prerequisite(s): None

Course Location: Remote

Zoom:

https://rutgers.zoom.us/j/99039872336?pwd=MlNpd3J2ZG0xOWdSYWhKYmZYQnFrUT09

  Meeting ID: 990 3987 2336

  Password: 680862

  By Phone: 646 558 8656

Course Date & Time: Monday; 6:00pm – 8:00 pm

Course Instructor: Nisha Jani PhD, MPH

                nisha.jani@rutgers.edu

Office Hours: Friday 10-11

Course Assistant: Yashoda Guardabasco

                yg310@sph.rutgers.edu

Office Hours: Tuesday 1-2

Course Website: https://canvas.rutgers.edu/

Required Text:

For Required Course Readings:

Cromley, E. K., & McLafferty, S. L. (2012). GIS and Public Health (Second ed.). New York: The Guilford Press. (ISBN13: 978-1609187507).

For In-Class Exercises and Homework Assignments:

Kurland, K. S., & Gorr, W. L. (2021). GIS Tutorial for Health (Sixth ed.). Redlands, CA: ESRI Press. (ISBN13: 978-1589486782).

GIS Software and Data

ESRI's Geographic Information Systems (GIS) software, ArcGIS 10.8.2, will be necessary for this class. This software will be used for in-class exercises as well as homework assignments. You are able to download a one-year personal use license personal use (https://www.esri.com/en-us/arcgis/products/arcgis-for-personal-use/buy) Two types of data will be used 1) free public use available on line 2) provided from GIS Tutorial for Health (data can also be downloaded https://learngis.maps.arcgis.com/home/item.html?id=bf4a28f6c4d8457fa40559173635b3b4

Course Description: The purpose of this course is to provide a broad introduction to the use of GIS in analyzing and addressing health problems. This course is designed to help students become conversant with some fundamental concepts in how GIS can be used to map and analyze the geographical distributions of populations at risk, health outcomes, and risk factors; to explore associations between risk factors and health outcomes; and to address health problems. We will use a variety of downloadable software for various spatial analysis applications. Additional reading materials are in the form of articles and will be supplied to students by the instructor

Competencies Addressed:

The competencies addressed in this course include:

- Select quantitative and qualitative data collection methods appropriate for a given public health context.
- Discuss the means by which structural bias and social inequities of health and create challenges to achieving health equity at community and societal levels

Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming, and software, as appropriate

- Select quantitative and qualitative data collection methods appropriate for a given public health context
- Apply epidemiological methods to the breadth of settings and situations in public health practice
- Interpret results of data analysis for public health research, policy or practice
- Communicate audience-appropriate public health content, both in writing and through oral presentation

Course Objectives: By the completion of this course, students will be able to:

- Define and discuss fundamental and technical concepts related to public health mapping, geographic information systems (GIS), and cartography
- Identify sources for health-related spatial data and maps
- Collect and record spatial and attribute data for public health mapping uses
- Identify and evaluate the characteristics of effective maps used in public health settings

- Interpret and describe map results to a non-technical audience
- Understand and analyze applications of GIS in the public health field

Course Requirements and Grading:

Course Format: The course combines lectures, in-class exercises, workbook/reading assignments, and a final project with presentation.

Class Participation is required. Students will be expected to attend class virtually via zoom and engage in class discussions. **Attendance will be taken every class**.

Homework: All registered students for this course will have access to the course on Canvas. Here you can access the article readings and upload your homework assignments. Assignments are due on the stated due date via Canvas by 11:59 PM.

Late assignment submissions will result in the following deductions:

- 15% automatic deduction if submitted within 24 hours following the due date/time
- 30% automatic deduction if submitted within 48 hours following the due date/time
- Assignments will **NOT** be accepted **after 48 hours** following the due date/time

Final Project and Presentation: The final project provides a synthesis of most ArcGIS skills learned throughout the semester in the form of a series of maps and a brief PowerPoint presentation. You will be provided with ample time to work on the project during the final third of the semester. You will select a geographic area and a specific health topic for your final project. Phases 1 and II of the project will consist of a set of required maps, such as an overview of your state/county/region, population, demographics, socioeconomics, and locations of schools, health services, and so on. Phase III of the project consists of a set of maps that address a medical and/or public health related topic. The final set of maps will have to demonstrate a set of required ArcGIS skillsets that you have learned throughout the semester. During the final class or classes, you will present a brief PowerPoint presentation of your project to the class that illustrates all required phases and techniques that the project requires, as well as your own interpretations and findings.

Grading

Attendance & Class Participation	*10 pts.*
Workbook/Reading Assignments	*35 pts.*
In-class exercise	*10pts*
Final Project	*35 pts.*
Final Project Presentation	*10 pts.*

RUTGERS
School of Public Health

Total: *100 pts.*

Grading Policy: *94 – 100   A*
                                 90 – <94   A-
                                 87 – <90   B+
                                 84 – <87   B
                                 80 – <84   B-
                                 77 – <80   C+
                                 70 – <77   C
                                 <70   F

Course Schedule: (Subject to change during semester)

SESSION	DATE	COURSE TOPIC	LINK TO COMPETENCIES	ASSIGNMENTS
1	Jan 23	Introductions to GIS and public health applications	Apply epidemiological methods to the breadth of settings and situations in public health practice	**Online 30**: Cromley & McLafferty: Introduction
2	Jan 30	Geographic Analysis Utilizing Census Data	Apply epidemiological methods to the breadth of settings and situations in public health practice	**Online 30**: Kurland & Gorr: Chapter 1: Introducing GIS & Health Applications (pp. 1-13)
3	Feb 6	Projecting and using spatial data	Select quantitative and qualitative data collection methods appropriate for a given public health context	**Online 30**: Cromley & McLafferty: Chapter 1: Geographic Information Systems **DUE: Kurland & Gorr Assignments 1-1 & 1-3 (2/14)**
4	Feb 13	Processing spatial data	Discuss the means by which structural bias and social inequities of health and create challenges to achieving health equity at community and societal levels	**Online 30**: Cromley & McLafferty: Chapter 2: Spatial Data (pp. 43-74) **DUE: Kurland & Gorr Assignments 2-1 & 2-2 (2/21)**
5	Feb 20	Geocoding tabular data	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	**Online 30**: Cromley & McLafferty: Chapter 3: Spatial Databases for Public Health **DUE: Kurland & Gorr Assignments 3-1 & 3-2 (2/28)**
6	Feb 27	Data acquisition	Select quantitative and qualitative data collection methods appropriate for a given public health context	**Online 30**: Cromley & McLafferty: Chapter 6: Analyzing Environmental Hazards (pp. 183-233) **DUE: Kurland & Gorr Assignment 4-1 & 4-2 (3/7)**
7	Mar 6	Uses of Arial photography and data presentation	Analyze quantitative and qualitative data using biostatistics, informatics,	**Online 30**: Cromley & McLafferty: Chapter 7: Analyzing

			computer-based programming and software, as appropriate	the Risk & Spread of Infectious Disease (pp. 234-262) **DUE: Concept Paper (3/21)**
8	Mar 13	Spring Break		
9	Mar 20	Outbreaks & Field Epidemiology	Apply epidemiological methods to the breadth of settings and situations in public health practice	**Online 30**: Cromley & McLafferty: Chapter 10: Locating Health Services (pp. 338-376) **DUE: Kurland & Gorr Assignment 7-1 & 7-2 (3/28)**
10	Mar 27	Transforming Data	Interpret results of data analysis for public health research, policy or practice	**DUE: Phase 1 Maps (4/4)**
11	Apr 3	Incorporation of Geographic Analysis in Published Literature	Apply epidemiological methods to the breadth of settings and situations in public health practice	**Online 30**: Cromley & McLafferty: Chapter 11: Health Disparities (pp. 377-406) **DUE: Phase 1 Maps (4/4)**
12	Apr 10	Incorporation of complex analysis	Analyze quantitative and qualitative data using biostatistics, informatics, computer-based programming and software, as appropriate	**Online 30**: Cromley & McLafferty: Chapter 12: Public Participation GIS & Community Health (pp. 407-424) **DUE: Phase 2 Maps (4/11)**
13	Apr 17	Group Work	Project	**Online 30**: reading will be distributed. **DUE: *Final Presentation (4/23) Pending***
14	Apr 24	Lecture/Final Project Presentations	Interpret results of data analysis for public health research, policy or practice	**Online 30**: reading will be distributed.
15	May 1	Lecture/Final Project Presentations	Communicate audience-appropriate public health content, both in writing and through oral presentation	**Online 30**: Cromley & McLafferty: Chapter 12: Public Participation GIS & Community Health (pp. 407-424)
16	May 8	Lecture/Final Project Presentations	Communicate audience-appropriate public health content, both in writing and through oral presentation	

Learning Management System: Canvas will be used extensively throughout the semester for course syllabus, assignments, announcements, communication and/or other course-related activities. It is the student's responsibility to familiarize themselves with Canvas and check it regularly. If you have difficulties accessing Canvas, please inform the instructor and Canvas Support (help@canvas.rutgers.edu). Canvas is accessible at canvas.rutgers.edu.

School of Public Health Honor Code: The School of Public Health Honor Code is found in the School Catalog (sph.rutgers.edu/academics/catalog.html). Each student bears a fundamental responsibility for maintaining academic integrity and intellectual honesty in his or her graduate work. For example, all

students are expected to observe the generally accepted principles of scholarly work, to submit their own rather than another's work, to refrain from falsifying data, and to refrain from receiving and/or giving aid on examinations or other assigned work requiring independent effort. In submitting written material, the writer takes full responsibility for the work as a whole and implies that, except as properly noted by use of quotation marks, footnotes, etc., both the ideas and the works used are his or her own. In addition to maintaining personal academic integrity, each student is expected to contribute to the academic integrity of the School community by not facilitating inappropriate use of her/his own work by others and by reporting acts of academic dishonesty by others to an appropriate school authority. It should be clearly understood that plagiarism, cheating, or other forms of academic dishonesty will not be tolerated and can lead to sanctions up to and including separation from the Rutgers School of Public Health.

Students with Disabilities: Rutgers University welcomes students with disabilities into all of the University's educational programs. In order to receive consideration for reasonable accommodations, a student must apply for Services by first completing a Registration Form with the Rutgers Office of Disability Services (ODS) at ods.rutgers.edu. The student will also be required to participate in an ODS intake interview and provide documentation. If reasonable accommodations are granted, ODS will provide you with a Letter of Accommodations which should be shared with your instructors as early in your courses as possible.

Commitment to Safe Learning Environment: The Rutgers School of Public Health is committed to helping create a safe learning environment for all students and for the School as a whole. Free expression in an academic community is essential to the mission of providing the highest caliber of education possible. The School encourages civil discourse, reasoned thought, sustained discussion, and constructive engagement. Provocative ideas respectfully presented are an expected result. An enlightened academic community, however, connects freedom with responsibility. The School encourages all students to disclose any situations where you may feel unsafe, discriminated against, or harassed. Harassment or discrimination of any kind will be not tolerated and violations may lead to disciplinary actions.

Reporting Discrimination or Harassment: If you experience any form of gender or sex-based discrimination or harassment, including sexual assault, sexual harassment, relationship violence, or stalking, know that help and support are available. You may report such incidents to the RBHS Title IX Office or to the School of Public Health's Office of Student Affairs. Rutgers University has staff members trained to support survivors in navigating campus life, accessing health and counseling services, providing academic and housing accommodations, and more. If you experience any other form of discrimination or harassment, including racial, ethnic, religious, political, or academic, please report any such incidents to the School's Office of Student Affairs. The School strongly encourages all students to report any incidents of discrimination or harassment to the School. Please be aware that all Rutgers employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers as listed in Appendix A to Policy 10.3.12) are required to report information about such discrimination and harassment to the School and potentially the University. For example, if you tell a faculty or staff member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty or staff member must share that information with the RBHS Title IX Coordinator. If you wish to speak to a confidential employee who does not have this reporting responsibility, you can find a list of resources in Appendix A to University Policy 10.3.12. For more information about your options at Rutgers, please visit Rutgers Violence Prevention and Victim Assistance.

Graduate Student Computer Policy: Students are required to possess a personal laptop, no older than approximately two years, that must meet minimum requirements which may be found online at: sph.rutgers.edu/student-life/computer-support.html

Policy Concerning Use of Recording Devices and Other Electronic Communications Systems: When personally owned communication/recording devices are used by students to record lectures and/or

classroom lessons, such use must be authorized by the faculty member or instructor who must give either oral or written permission prior to the start of the semester and identify restrictions, if any, on the use of mobile communications or recording devices.

Policy Concerning Use of Turnitin: Students agree that by taking this course all required papers may be subject to submission for textual similarity review to Turnitin.com (directly or via learning management system, i.e. Canvas) for the detection of plagiarism. All submitted papers will be included as source documents in the Turnitin.com reference database solely for the purpose of detecting plagiarism of such papers. Use of the Turnitin.com service is subject to the Usage Policy posted on the Turnitin.com site. Students who do not agree should contact the course instructor immediately.

Withdrawal/Refund Schedule: Students who stop attending their course(s) without submitting a completed Add/Drop Course form will receive a failing grade. Furthermore, students dropping to zero credits for the semester are considered withdrawn and must submit a completed Leave of Absence form from the School of Public Health's Office of Student Affairs. The School of Public Health refunds tuition only. Administrative and technology fees are non-refundable. You may find the Withdrawal/Refund Schedule on the School of Public Health website at: sph.rutgers.edu/academics/academic-calendar.html

Student Well-Being: The School of Public Health recognizes that students may experience stressors or challenges that can impact both their academic experience and their personal well-being. If the source of your stressors or challenges is academic, students are encouraged to discuss these challenges and circumstances with their instructor, if they feel they may need additional support or temporary accommodations at the beginning or during this course. The course instructor may consider making reasonable temporary adjustments depending on the student's situation. For personal concerns or if additional support is needed, students may reach out to the Office of Student Affairs (studentaffairs@sph.rutgers.edu) or any of the appropriate referral resources listed on the SPH Student Connect Canvas page.

Overview of School Policies: Academic and non-academic policies and procedures, such Auditing a Course, Retaking Courses, Grade Grievance and others that cover registration, courses and grading, academic standing and progress, student rights and responsibilities, graduation and more may be found under Policies on the School of Public Health website. Below are select specific policies; however, students are responsible for keeping informed about academic and non-academic policies and procedures beyond those noted on this syllabus.

Remote Learning Policies

All students are expected to adhere to the following policies.

General: Log into Zoom using your Rutgers NetID and sign-in with your full first name and last name as listed on the class roster. (If you use a different name than what is listed on the class roster, please email the instructor in advance of the class or send a private Chat message.) Using your full name allows the instructor to know who is in attendance and to quickly sort students into their groups when needed. Users who do not log into Zoom using their Rutgers NetID may have trouble accessing the Zoom classroom.

Video: ***Please turn on your video when possible***. We recognize that this isn't always easy, but this will help to build our class community. Seeing the faces of your classmates more closely duplicates the typical in-person learning experience and may shift your mindset into more focus and attention. Seeing each other can also provide each of us with positive social interactions.
- If you're unable to find an environment without a lot of visual distractions or prefer to not show your living space as a background, feel free to use a virtual background (several virtual

background images created by the School of Public Health are available in the [Student Connect Canvas page](#)).

- To save bandwidth, there may be times during class when the instructor asks students to turn off videos.
- Add a photo to your Zoom profile. (Then in times when videos are off, we'll see photos of everyone rather than an empty box.)
- If you have limited internet bandwidth or other issues impacting your video use, please inform the instructor.

<u>Audio</u>: Mute your microphone when you are not talking. This helps eliminate background noise.

- Use a headset, if possible. If you own headphones with a microphone, please use them. This improves audio quality.
- Be in a quiet place, if possible. Turn off any music, videos, etc. in the background.

<u>Chat</u>: Stay on topic and be respectful. Use the chat window for questions and comments that are relevant to class.