

# School of Public Health

## Syllabus and Course Information



UNIVERSITY OF MINNESOTA  
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### PubH 7253 Section 101 Class # 87551

#### Introduction to GIS

#### May Session 2017

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**Credits:** 1 credit

**Meeting Days/Times:** May 30 9:00am - 12:00pm  
May 31, June 1, 2 8:00am - 12:00pm

**Meeting Place:** Blegen Hall – Room 455

**Instructors:** Len Kne, MGIS  
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**Office Hours:** By appointment

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#### I. Course Description

This course is an introduction to the concepts and uses of Geographic Information Systems (GIS). Lecture topics include GIS data structures, sources of data, GIS tools, vendors and software, health-related GIS applications, and resources. Through a combination of presentations and hands-on exercises, participants will learn and apply basic GIS concepts and the fundamentals of spatial analysis. Hands-on exercises include spatial data display and query, map generation, field data collection, and simple spatial analysis using ArcGIS software. Students will be required to apply GIS concepts, assigned readings, and project development principles to create their own GIS project model.

This course is designed for participants who have not had experience working with GIS software or applications; however, participants should have some experience with spreadsheets.

### **Competencies**

The core competencies in Public Health Preparedness and Response identified in the CDC planning model that apply to this course include:

#### **Domain 2: Communicate and Manage Information**

2.1 Manage information related to an emergency

2.4 Collect data according to protocol

The core competencies identified in the HRSA Council of Linkages model that apply to this course include:

#### **Analytic/Assessment Skills Tier 2:**

1.2. Determines quantitative and qualitative data and information needed for assessing the health of a community

1.4. Uses information technology in accessing, collecting, analyzing, using, maintaining, and disseminating data and information

1.10. Interprets quantitative and qualitative data

## **II. Course Prerequisites**

None

## **III. Course Goals and Objectives**

Upon completion of this course participants will have experience:

1. accessing and using GIS data
2. collecting data for use in a GIS
3. preparing data for use in a GIS
4. joining data to GIS mapping files
5. working with basic thematic mapping
6. analyzing spatial information
7. working with geocoding (address mapping)
8. employing proper map-making techniques
9. sharing GIS maps and data
10. creating a GIS project model designed to investigate a public health research question using GIS

## **IV. Methods of Instruction and Work Expectations**

- Presentations will cover basic GIS concepts, an introduction to spatial analysis, using GIS in public health, and the inputs required to conceptualize and create a successful GIS project. Participants will be expected to complete assigned readings so they can fully participate in lectures.
- Computer-based exercises will include preparing data for use in a GIS, joining data to GIS mapping files, basic thematic mapping, geocoding, field data collection, and spatial analysis. Exercises will use Esri ArcGIS 10, ArcGIS Online, and ArcGIS Collector application. Classes will be held in a computer lab (on a Windows operating system) and outside for field data collection. Participants will be required to complete each assigned exercise.

- A final project will require participants to work in groups to create a GIS Project Model that answers a research question. Time will be given in class to prepare a 15-minute presentation which will be presented by the group on day 4 of class.

## V. Course Text and Readings

The required and optional readings are available through the UMN Library, which can be accessed through the course Moodle site.

### Access Course Moodle Site

- go to [moodle.umn.edu](http://moodle.umn.edu)
- login with your University ID and password

### Required Pre-course Preparatory Readings:

Introduction to GIS - Cromley, Ellen K and Sara McLafferty. GIS and Public Health, 2nd Edition. (503 pages) Guilford Press, 2011. Pages 1-42 (will be on reserve at library)

ArcGIS Online - <http://www.arcgis.com/features/>

Public Health GIS readings:

<http://www.esri.com/industries/health>

### Required Readings:

- Brewer, Cynthia. 2006. Basic Mapping Principles for Visualizing Cancer Data using Geographic Information Systems (GIS). *American Journal of Preventive Medicine* 30(2S):S25-36. **PMID: 16458787**

### Suggested Texts:

- Cromley, Ellen K and Sara McLafferty. GIS and Public Health, 2nd Edition. (503 pages) Guilford Press, 2011. ISBN: 9781609187507

## VI. Course Outline/Weekly Schedule

Day/Time	Type	Class Content	Readings
Day 1 (Tuesday)			
9:00am - 10:00am	Lecture	Course outline Introduction to GIS	Introduction to GIS
10:00am - 11:30am	Lecture/Exercise	Introduction to ArcGIS Online	ArcGIS Online
11:30am - 12:00pm	Lecture	Introduction to the GIS project model	
Day 2 (Wednesday)			
8:00am - 11:00am	Lecture/Exercise	Data creation, selection, manipulation, and exploration using ArcGIS Desktop	
11:00am - 12:00pm	Group Work	Group selection & project work	

Day 3 (Thursday)			
8:00am - 10:00am	Lecture/Exercise	Spatial analysis for public health	
10:00am - 11:00am	Exercise	Field data collection	
11:00am - 12:00pm	Lecture	Group project work	
Day 4 (Friday)			
8:00am - 9:30am	Lecture/Exercise	Cartography and map design	
9:30am - 11:45am	Presentation	Group project presentations	
11:45am - 12:00pm	Discussion	Wrap-up / Q&A	

## VII. Evaluation and Grading

### Grading Criteria

- In-class exercises must be completed. (60 points/percent of grade)
- Final group project must be presented. (40 points/percent of grade)
- All absences and missing assignments must be discussed with the instructor.
  
- **This course is S/N only**  
**S Represents achievement that is satisfactory, which is equivalent to a C- (70%) or better.**

### For additional information, please refer to:

<http://policy.umn.edu/Policies/Education/Education/GRADINGTRANSCRIPTS.html>

### Course Evaluation

The SPH will collect student course evaluations electronically using a software system called CourseEval: [www.sph.umn.edu/courseeval](http://www.sph.umn.edu/courseeval). The system will send email notifications to students when they can access and complete their course evaluations. Students who complete their course evaluations promptly will be able to access their final grades just as soon as the faculty member renders the grade in SPHGrades: [www.sph.umn.edu/grades](http://www.sph.umn.edu/grades). All students will have access to their final grades through OneStop two weeks after the last day of the semester regardless of whether they completed their course evaluation or not. Student feedback on course content and faculty teaching skills are an important means for improving our work. Please take the time to complete a course evaluation for each of the courses for which you are registered.

### Incomplete Contracts

A grade of incomplete "I" shall be assigned at the discretion of the instructor when, due to extraordinary circumstances (e.g., documented illness or hospitalization, death in family, etc.), the student was prevented from completing the work of the course on time. The assignment of an "I" requires that a contract be initiated and completed by the student before the last official day of class, and signed by both the student and instructor. If an incomplete is deemed appropriate by the instructor, the student in consultation with the

instructor, will specify the time and manner in which the student will complete course requirements. Extension for completion of the work will not exceed one year (or earlier if designated by the student's college). For more information and to initiate an incomplete contract, students should go to SPHGrades at: [www.sph.umn.edu/grades](http://www.sph.umn.edu/grades).

**University of Minnesota Uniform Grading and Transcript Policy** - A link to the policy can be found at [onestop.umn.edu](http://onestop.umn.edu).

## VIII. Other Course Information and Policies

### **Grade Option Change** (if applicable)

For full-semester courses, students may change their grade option, if applicable, through the second week of the semester. Grade option change deadlines for other terms (i.e. summer and half-semester courses) can be found at [onestop.umn.edu](http://onestop.umn.edu).

### **Course Withdrawal**

Students should refer to the Refund and Drop/Add Deadlines for the particular term at [onestop.umn.edu](http://onestop.umn.edu) for information and deadlines for withdrawing from a course. As a courtesy, students should notify their instructor and, if applicable, advisor of their intent to withdraw.

Students wishing to withdraw from a course after the noted final deadline for a particular term must contact the School of Public Health Office of Admissions and Student Resources at [sph-ssc@umn.edu](mailto:sph-ssc@umn.edu) for further information.

### **Student Conduct Code**

The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry, and that serves the educational mission of the University. Similarly, the University seeks a community that is free from violence, threats, and intimidation; that is respectful of the rights, opportunities, and welfare of students, faculty, staff, and guests of the University; and that does not threaten the physical or mental health or safety of members of the University community.

As a student at the University you are expected adhere to Board of Regents Policy: *Student Conduct Code*. To review the Student Conduct Code, please see:

[http://regents.umn.edu/sites/default/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf).

Note that the conduct code specifically addresses disruptive classroom conduct, which means "engaging in behavior that substantially or repeatedly interrupts either the instructor's ability to teach or student learning. The classroom extends to any setting where a student is engaged in work toward academic credit or satisfaction of program-based requirements or related activities."

### **Use of Personal Electronic Devices in the Classroom**

Using personal electronic devices in the classroom setting can hinder instruction and learning, not only for the student using the device but also for other students in the class. To this end, the University establishes the right of each faculty member to determine if and how personal electronic devices are allowed to be used in the classroom. For complete information, please reference:

<http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

### **Scholastic Dishonesty**

You are expected to do your own academic work and cite sources as necessary. Failing to do so is scholastic dishonesty. Scholastic dishonesty means plagiarizing; cheating on assignments or examinations; engaging in unauthorized collaboration on academic work; taking, acquiring, or using test materials without faculty permission; submitting false or incomplete records of academic achievement; acting alone or in cooperation with another to falsify records or to obtain dishonestly grades, honors, awards, or professional endorsement; altering, forging, or misusing a University academic record; or fabricating or falsifying data, research procedures, or data analysis. (Student Conduct Code:

[http://regents.umn.edu/sites/default/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/default/files/policies/Student_Conduct_Code.pdf)) If it is determined that a student has cheated, he or she may be given an "F" or an "N" for the course, and may face additional sanctions from the University. For additional information, please see:

<http://policy.umn.edu/Policies/Education/Education/INSTRUCTORRESP.html>.

The Office for Student Conduct and Academic Integrity has compiled a useful list of Frequently Asked Questions pertaining to scholastic dishonesty: <http://www1.umn.edu/oscai/integrity/student/index.html>. If you have additional questions, please clarify with your instructor for the course. Your instructor can respond to your specific questions regarding what would constitute scholastic dishonesty in the context of a particular class-e.g., whether collaboration on assignments is permitted, requirements and methods for citing sources, if electronic aids are permitted or prohibited during an exam.

### **Makeup Work for Legitimate Absences**

Students will not be penalized for absence during the semester due to unavoidable or legitimate circumstances. Such circumstances include verified illness, participation in intercollegiate athletic events, subpoenas, jury duty, military service, bereavement, and religious observances. Such circumstances do not include voting in local, state, or national elections. For complete information, please see: <http://policy.umn.edu/Policies/Education/Education/MAKEUPWORK.html>.

### **Appropriate Student Use of Class Notes and Course Materials**

Taking notes is a means of recording information but more importantly of personally absorbing and integrating the educational experience. However, broadly disseminating class notes beyond the classroom community or accepting compensation for taking and distributing classroom notes undermines instructor interests in their intellectual work product while not substantially furthering instructor and student interests in effective learning. Such actions violate shared norms and standards of the academic community. For additional information, please see: <http://policy.umn.edu/Policies/Education/Education/STUDENTRESP.html>.

### **Sexual Harassment**

"Sexual harassment" means unwelcome sexual advances, requests for sexual favors, and/or other verbal or physical conduct of a sexual nature. Such conduct has the purpose or effect of unreasonably interfering with an individual's work or academic performance or creating an intimidating, hostile, or offensive working or academic environment in any University activity or program. Such behavior is not acceptable in the University setting. For additional information, please consult Board of Regents Policy: <http://regents.umn.edu/sites/default/files/policies/SexHarassment.pdf>

### **Equity, Diversity, Equal Opportunity, and Affirmative Action**

The University will provide equal access to and opportunity in its programs and facilities, without regard to race, color, creed, religion, national origin, gender, age, marital status, disability, public assistance status, veteran status, sexual orientation, gender identity, or gender expression. For more information, please consult Board of Regents Policy: [http://regents.umn.edu/sites/default/files/policies/Equity\\_Diversity\\_EO\\_AA.pdf](http://regents.umn.edu/sites/default/files/policies/Equity_Diversity_EO_AA.pdf).

### **Disability Accommodations**

The University of Minnesota is committed to providing equitable access to learning opportunities for all students. Disability Services (DS) is the campus office that collaborates with students who have disabilities to provide and/or arrange reasonable accommodations.

If you have, or think you may have, a disability (e.g., mental health, attentional, learning, chronic health, sensory, or physical), please contact DS at 612-626-1333 to arrange a confidential discussion regarding equitable access and reasonable accommodations.

If you are registered with DS and have a current letter requesting reasonable accommodations, please contact your instructor as early in the semester as possible to discuss how the accommodations will be applied in the course.

For more information, please see the DS website, <https://diversity.umn.edu/disability/>.

### **Mental Health and Stress Management**

As a student you may experience a range of issues that can cause barriers to learning, such as strained relationships, increased anxiety, alcohol/drug problems, feeling down, difficulty concentrating and/or lack of motivation. These mental health concerns or stressful events may lead to diminished academic performance and may reduce your ability to participate in daily activities. University of Minnesota services are available to

assist you. You can learn more about the broad range of confidential mental health services available on campus via the Student Mental Health Website: <http://www.mentalhealth.umn.edu>.

**The Office of Student Affairs at the University of Minnesota**

The Office for Student Affairs provides services, programs, and facilities that advance student success, inspire students to make life-long positive contributions to society, promote an inclusive environment, and enrich the University of Minnesota community.

Units within the Office for Student Affairs include, the Aurora Center for Advocacy & Education, Boynton Health Service, Central Career Initiatives (CCE, CDes, CFANS), Leadership Education and Development–Undergraduate Programs (LEAD-UP), the Office for Fraternity and Sorority Life, the Office for Student Conduct and Academic Integrity, the Office for Student Engagement, the Parent Program, Recreational Sports, Student and Community Relations, the Student Conflict Resolution Center, the Student Parent HELP Center, Student Unions & Activities, University Counseling & Consulting Services, and University Student Legal Service.

For more information, please see the Office of Student Affairs at <http://www.osa.umn.edu/index.html>.

**Academic Freedom and Responsibility: for courses that do not involve students in research**

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.\*

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

**OR:**

**Academic Freedom and Responsibility, for courses that involve students in research**

Academic freedom is a cornerstone of the University. Within the scope and content of the course as defined by the instructor, it includes the freedom to discuss relevant matters in the classroom and conduct relevant research. Along with this freedom comes responsibility. Students are encouraged to develop the capacity for critical judgment and to engage in a sustained and independent search for truth. Students are free to take reasoned exception to the views offered in any course of study and to reserve judgment about matters of opinion, but they are responsible for learning the content of any course of study for which they are enrolled.\* When conducting research, pertinent institutional approvals must be obtained and the research must be consistent with University policies.

Reports of concerns about academic freedom are taken seriously, and there are individuals and offices available for help. Contact the instructor, the Department Chair, your adviser, the associate dean of the college, or the Vice Provost for Faculty and Academic Affairs in the Office of the Provost.

\* Language adapted from the American Association of University Professors "Joint Statement on Rights and Freedoms of Students".