

## PA 5271: Syllabus – Spring 2018



### Course Syllabus

<b>Course Name:</b>	PA 5271—GIS: Applications in Planning and Policy Analysis
<b>Instructor/Contact:</b>	Geoff Maas / <a href="mailto:maas0021@umn.edu">maas0021@umn.edu</a> / 763.772.4287
<b>Classroom:</b>	HHH 85 (Computer Lab);
<b>Time:</b>	6:00 – 8:45 pm, Tuesday Evenings
<b>Office Hours:</b>	8:45 pm – 10:00 pm (HHH 85);
<b>Credits &amp; Format:</b>	3.0 credits / Lecture and Lab;
<b>Pre-Requisites:</b>	MURP candidate or consent of instructor;

**Course Introduction:** Geographic Information Systems (GIS) are an important supportive technology for the fields of planning and public policy. Many professional fields involve exploring location-based issues and the tools offered by GIS facilitates spatial visualization of phenomena such as crime, poverty, pollution, public health, land use, economics, environmental conditions and many others. GIS—a discipline in its own right—is now firmly woven into the fabric of government and into many business operations; it is vital that students of planning and public policy have a fundamental operational knowledge of the concepts, application, and potential of GIS technology.

**Course Goals:** Upon completion of this course students can expect to:

- *Be familiar with core terminology, concepts, data types, usage and applications of GIS;*
- *Demonstrate and make use of a foundational set of technical GIS skills;*
- *Have a sound understanding of how GIS can be applied to planning and public policy work;*
- *Be able to communicate with and work effectively with experienced GIS professionals in the workforce;*
- *Be able to apply spatial thinking and locational problem solving to the work of planning and public policy;*
- *Be able to frame, address and propose solutions to a diverse variety of planning and public policy problems by 'thinking spatially' and using GIS technology.*

**Course Overview:** The course is introductory in nature; with the assumption that the majority of the students have little or no formal technical experience using GIS. Additionally, it is assumed that as students are seeking a graduate education in the fields of planning and public policy; their primary career intention is not to become deep technical experts or full-time practitioners in GIS. However, being able to perform basic GIS analysis, understand the data, make use of visualization and mapping tools and communicate effectively are core skills expected of planning and public policy professionals.

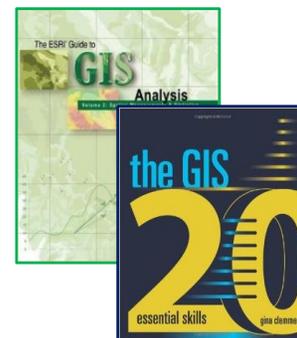
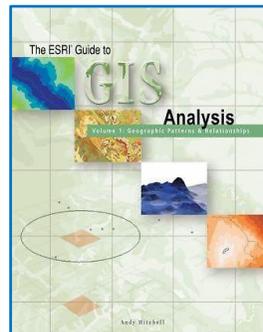
#### Primary reference:

*The ESRI Guide to GIS Analysis, Volume 1*  
Andy Mitchell, ESRI Press

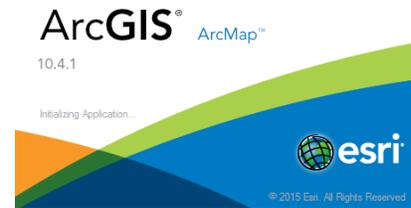
#### Recommended (optional) references:

*The ESRI Guide to GIS Analysis, Volume 2*  
Andy Mitchell, ESRI Press

*The GIS 20 Essential Skills*  
Gina Clemmer, ESRI Press



**Software and Logistics:** We will be using **ESRI's ArcGIS** software in the HHH 85 lab. Copies of the software are available on all computers in the HHH 85 computer lab. Access to the Humphrey Computer lab (HHH 85) requires only your University of Minnesota student ID card. There are also computers with the software loaded in Rooms 40 and 80 (also requiring student ID card access).



We will be working from the “T:” Drive. There are two subdirectories on this drive containing the data and workspaces for the course:

- **PA5271\_maas0021\_Data** contains the datasets to be used in labs and assignments as well as the general course materials, syllabus, readings, handouts and assignments.
- **PA5271\_maas0021\_Students** contains the ‘workspace’ for the course. A group of subfolders, one for each student, providing them a private workspace. The instructor has access to each student’s workspace as well, and may—from time to time—copy data directly into a student’s folder.

**Moodle.** Course materials will also be published on the Moodle site including readings and instructions for assignments and in-class lab exercises.

***Food and drink are not permitted at the workstations in the lab to protect the equipment from damage.*** There are shelves in the back of the lab where food and drink can be stored while you are working. Students are able to take breaks during lecture and lab time as needed.

**Evaluation:** Students will be evaluated based upon performance on four factors:

- A series of nine assignments (11 assignments, 5 points each: 55% of grade);
- A final project concept of their own design (25% of grade);
- Class participation – attendance and completion of in-class lab work (10% of grade);
- A final examination (10% of grade);

For the final project, students are encouraged to choose a topic to research; this being in urban planning or policy issue that aligns with their area of interest. The instructor will provide guidance early in the course for helping students to shape, define, refine and begin their final project. Students will be expected to present their final project concept to the class at the end of the term.

**Attendance Requirements:** As PA 5271 has both a lecture and lab component, attendance is important to the student’s success in the course. The instruction has each student initial a course roster at the beginning of each class period and students receive full points for attendance each class period. Students will receive partial points for excused absences (by contacting the instructor prior to the class meeting via phone or email) so long as their assignments are submitted in a timely fashion. Students receive no points for being absent. As noted above in Evaluation section above, attendance is an integral part of Class Participation and forms 15% of the final grade for the course.

**Extra Credit:** No extra credit options are available for PA 5271. The final exam will contain a small number of bonus questions that can aid the student’s final test score if answered correctly, but will not reduce their score if left unanswered or answered incorrectly.

**Missed exams and late work:** The student may make arrangements with the instructor for handling situations where timing or scheduling prohibits a student from attending a test date or is unable to submit an assignment on its scheduled due date. The instructor encourages the students to be proactive and contact the instructor as early as possible if known schedule conflicts are anticipated.

**Final exam:** The final exam is a comprehensive, written exam. The final exam will occur at the end of the course during the University of Minnesota's designated final exam week, or during the final formal course period at the discretion of the instructor and needs of the semester schedule.

**Student Academic Integrity and Scholastic Dishonesty:** Academic integrity is essential to a positive teaching and learning environment. All students enrolled in University courses are expected to complete coursework responsibilities with fairness and honesty. Failure to do so by seeking unfair advantage over others or misrepresenting someone else's work as your own, can result in disciplinary action. The University Student Conduct Code defines scholastic dishonesty as follows:

*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. Within this course, a student responsible for scholastic dishonesty can be assigned a penalty up to and including an "F" or "N" for the course. If you have any questions regarding the expectations for a specific assignment or exam, ask.*

The University of Minnesota's Office for Student Conduct and Academic Integrity's website contains the University's policies and procedures on conduct and disciplinary actions: [www.oscai.umn.edu](http://www.oscai.umn.edu)

**Student Conduct Code:** The University seeks an environment that promotes academic achievement and integrity, that is protective of free inquiry and which 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/regents.umn.edu/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/regents.umn.edu/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."

**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/education/makeupwork>.

## PA 5271 Class Schedule and Assignments – Spring 2018

Please note, this schedule is a general framework. The instructor will adhere to this general schedule, but reserves the right to modify the schedule to best present the material and instruct the students and to respond to new topical ideas, student interest and technological developments which may enhance the course.

- Session 1: January 16, 2018 – Course Intro: History and Overview of GIS**  
Reading: Mitchell, Volume 1, pp. 10-15  
Lecture 1: [Course Introduction: History and Overview of GIS](#)  
Lab 1: Basic ArcCatalog and ArcMap functions, Importing Data  
Assignment 1: [Map sample collection and critique](#)
- Session 2: January 23, 2018 – Cartographic Principles and Map Design**  
Reading: Kent and Klosterman, 'Pitfalls for Planners'  
Lecture 2: [Core Cartographic Principles, Map Design & Data Models](#)  
Lab 2: Coordinate Systems and Map Projections  
Assignment 2: [Cartography and Map Layout](#)
- Session 3: January 30, 2018 – Metadata and Working with Tables and Queries**  
Reading: Mitchell, Volume 1, pp. 18-19  
Lecture 3: [Metadata and Working with Tables and Queries](#)  
Labs 3a & 3b: 3a: Metadata, 3b: Working with Geodatabases  
Assignment 3: [Urban/Suburban Mortality Rate Analysis](#)

### February 6, 2018 -- NO CLASS (Caucus Tuesday)

- Session 4: February 13, 2018 – Topology Concepts and Working with Census Data**  
Readings: Mitchell, Volume 1, pp. 38-55, 60-62, 66-67  
Peters and MacDonald 'Unlocking the Census with GIS'  
American Community Survey Handbook  
Lecture 4: [Topology Concepts and Census Data](#)  
Lab 4: Finding and Working with American Community Survey Data  
Assignment 4: [Ramsey County Demographic Mapping](#)
- Session 5: February 20, 2018 – Land Cover, Land Use, Planned Use and Zoning Data**  
Reading: Mitchell, Volume 1, pp. 90-97, 101-104  
Lecture 5: [Working with Land Use, Land Cover, Planned Use and Zoning Data](#)  
Lab 5: Exploring ArcGIS Tools: Buffering and Area Calculation  
Assignment 5: [Green Line Light Rail Transit Stop Site Analysis](#)
- Session 6: February 27, 2018 – Geocoding, Addressing & Parcel Data**  
Reading: Goldberg, 'A Geocoding Best Practices Guide', pp. 3-18  
Lecture 6: [Working With Geocoding, Addressing and Parcel Data](#)  
Lab 6: Working with Excel to Prepare Data for Geocoding  
Assignment 6: [Geocoding Data Exercise](#)  
Final Project: [First Draft Final Project Statement and Idea Submittal is due](#)

**Session 7: March 6, 2018 – Environmental Justice Mapping & Geo-processing**  
Readings: Burtman, ‘The Revolution Will Be Mapped’  
Hopkins, ‘Understanding Types of Low Income Neighborhoods’  
Lecture 7: “The Cities Divided: How Public Policy Gave Minneapolis-St.Paul its Shape”  
Lab 7: Geoprocessing Tools: Using the Intersect Tool  
Assignment 7: Geoprocessing Tools: Minneapolis Neighborhood Analysis

**March 13, 2018 – NO CLASS (Spring Break)**

**Session 8: March 20, 2018 – Introduction to Web Mapping & Data Typologies**  
Reading: ESRI Press “GIS in the Web Era”  
Lecture 8: Overview of Web Mapping and Data Typologies  
Lab 8: Shapefile (.shp) to Keyhole Markup file (.kml) translation  
Assignment 8: Introduction to ArcGIS Online

**Session 9: March 27, 2018 – Hot Spot Analysis and Introduction to Interpolation**  
Reading: Mitchell, Volume 1, pp. 90-97, 101-104  
Lecture 8: Hot Spot Analysis and Interpolation  
Lab 8: Hot Spot Visualization and Analysis  
Assignment 9: Spatial Interpolation (Measuring Ozone in California)

**Session 10: April 3, 2018 – Dividing the Land, Linear Networks and Creating Data**  
Reading: Tutorial on the PLSS Descriptions (WIDNR) & Dominion Land Survey (Andronak)  
Lecture 10: Dividing the Land and Linear Networks  
Lab 10: Introduction to Geo-rectification  
Assignment 10: Digitizing and Creating Point, Line and Polygon Data

**Session 11: April 10, 2018 – GPS, Aerial Imagery, Remote Sensing and LIDAR**  
Reading: NOAA, “LIDAR 101”  
Lecture 11: GPS, Aerial Imagery, Remote Sensing and LIDAR  
Lab 11: Extracting data from the MNTPO Application  
Assignment 11: Working with Raster-based data in GIS

**Session 12: April 17, 2018 – Student Presentations I**

**Session 13: April 24, 2018 – Student Presentations II and Course Evaluation**

**Session 14: May 1, 2018 – Final Exam**

**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/education/studentresp>.

**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/regents.umn.edu/files/policies/Student\\_Conduct\\_Code.pdf](http://regents.umn.edu/sites/regents.umn.edu/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/education/instructorresp>.

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.

**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/education/studentresp>.

**Grading and Transcripts:** The University utilizes plus and minus grading on a 4.000 cumulative grade point scale in accordance with the following:

A	4.000 – Represents achievement that is outstanding relative to the level necessary to meet course requirements
A-	3.667
B+	3.333
B	3.000 – Represents achievement that is significantly above the level necessary to meet course requirements
B-	2.667
C+	2.333
C	2.000 – Represents achievement that meets the course requirements in every respect
C-	1.667
D+	1.333
D	1.000 – Represents achievement that is worth of credit even though it fails to meet fully the course requirements
S	Represents achievement that is satisfactory, which is equivalent to a C- or better

For additional information, please refer to: <http://policy.umn.edu/education/gradingtranscripts>.

**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/regents.umn.edu/files/policies/SexHarassment.pdf>

**Equity, Diversity, Equal Opportunity, and Affirmative Action:** The University provides 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/regents.umn.edu/files/policies/Equity\\_Diversity\\_EO\\_AA.pdf](http://regents.umn.edu/sites/regents.umn.edu/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. The Disability Resource Center 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>.

**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.