Geography 471/671 GIS Applications in Sustainability
Syllabus - SEM II 2014-15

Instructor: Eugene Martin. gmartin@uwsp.edu. Science B343.
Office hours: Mo 11-12 & 1-2; Tu 11-12 & 1-3; We 1-2; Th 11-1; or by appointment.

Course meeting times:

Type	Day	Hour	Location
Lecture & lab	M W F	12:00 - 12:50	Science D326

Course overview: GEOG471 explores the ways GIScience concepts and analysis methods can support sustainability planning and implementation. A brief history and development of the sustainability movement establishes context, motivation and priorities of initiatives and connects with modes of GIS services that support community awareness and action. Characteristics of public participation GIS (PPGIS) frame the situatedness of GIS engaged for community empowerment. Discovery of sustainability issues, spatial data and analyses follows a conceptual and geographical trend from local to global scales. These include population density, land cover change, urban growth/sprawl, transportation, walkable neighborhoods, water resources, green infrastructure, landscape prioritization, footprint analysis, and climate change. Approaches with GIS include measurement of indicators/change, resource optimization, resource siting, least cost and proximity. Spatial data surveyed through the course comprise US decennial census, road networks, land use, parcels, NSIDC Arctic ice atlas, STRM, and utilities. Experience with these methods and data resources takes place in eight laboratory exercises presented regularly through the semester. The situatedness of sustainability initiatives, GIS implementation, and the GIS consultant's responsibilities are revisited repeatedly to better appreciate the dynamism of technological support for socially based quality of life decision-making.

Prerequisites: Geog279, 476/676 or instructor permission

Instructor commitment: The instructor will a) present clear, engaging, challenging lecture/lab presentations; b) keep the course on schedule; c) challenge each student to question; d) conduct fair and equitable evaluation of student work; e) encourage student participation; f) be available and accessible by email and office hours or appointments; g) be responsive to student needs/requests.
The instructor will not a) provide *the correct* answer without students' critical engagement of the question; b) scale grades to an established curve; c) pretend to teach; d) let students pretend to learn.

Student commitment: Students are required to engage with the course through regular attendance, active participation, and successful completion of all assignments. Students are also expected to read all assigned materials and to ask informed questions regarding the subject matter. As per the Student Handbook, students should anticipate two hours of course work for each hour of lecture or lab. Geog471 consists of two lecture and two lab hours a week meaning students can expect an estimated eight hours of self study beyond scheduled lecture and lab times. Students having difficulty completing the course work should consult with the instructor before falling behind.

Student Rights and Responsibilities: Your rights and responsibilities within the UWSP campus community, including required behavior by students and faculty within the classroom environment are detailed in these documents:
http://www.uwsp.edu/admin/stuaffairs/rights/rightsCommBillRights.pdf
http://www.uwsp.edu/admin/stuaffairs/rights/rightsChap14.pdf.

Required text: The course text is *GIS for Sustainable Development*, edited by Michele Campagna and Roseland, M. *Toward sustainable communities*. See UWSP text rental: http://www.uwsp.edu/centers/textrental/index.asp for details. An electronic copy of *GIS for Sustainable Development* is linked here. Readings from Pervis and Granger *Exploring Sustainable Development: Geographical Perspectives,* Bell and Morse *Sustainability Indicators - Measuring the Immeasurable*, Wise and Craglia *GIS and Evidence Based Decision Making,* and other reading assignments will be available through UWSP Library E-reserve and the course D2L site. Expected dates for completion of reading assignments are listed with the lecture/lab schedule.   Knowledge and understanding of required readings is expected prior to scheduled lecture and lab instruction and demonstrations. Learning outcomes from these required readings will be identified during lecture and lab presentations.

Desire2Learn (D2L): The course D2L page is a resource for lecture, lab and assignment management. Students are expected to be familiar and proficient with all of D2L features and functions. Lecture/lab outlines are linked to online content, required readings and related assignments. Note: D2L course resources are not a substitute for attending lecture or lab. The lecture/lab content on D2L are not self-explanatory and do not support stand-alone self study. Drop boxes are used for submission of all course deliverables. Discussion forums for lecture, lab assignments and exams are open dialogs for questions and answers and all students are encouraged to participate or observe the postings because these conversations extend the dialog for better understanding of the course learning outcomes.

Software: ESRI's ArcGIS software with extensions will be employed for the applied exercise portion of the class. The same are used for lecture demonstrations.

SIAL Lab policies: Lab policies are posted on bulletin boards in the SIAL. See Mary Clare Sorenson in the department office to receive keys for the lab. Please pay attention to the rules for the keys on the signed form especially the ones that will result is revocation of key privileges.

Attendance: This course adheres to the UWSP attendance policy. Attendance is expected for all class meeting and absences will be noted. Regular attendance and participation in lecture and lab

sessions are an integral and essential part of learning in this course. Many themes presented in lecture and lab are not addressed in the required reading or on D2L content. University organization-sanctioned events, class field trips, death in the family, serious illness, accident, or similar are justifiable absences and will be considered for accommodation and a reasonable amount of additional help outside of normal lecture, lab and office hours. If you miss a class, even for a legitimate reason, you are still responsible for the material. Attendance will be periodically taken during lecture meetings. A penalty of three points from the final grade will be registered after the third unexpected absence and an additional point for each absence thereafter.

Lectures: Lectures introduce the core geographic information science concepts and practical applications that are further developed in the lab assignments. These build upon and extend material introduced in the required readings and concepts presented in prior lecture/lab meetings. They are the richest source of concise and accessible insight and knowledge needed to complete assignments and realize the course learning outcomes.

Labs: The course features six exercises for practical application of the course concepts and GIS operations. These will be introduced in lecture and some lecture meetings will be dedicated to working on the lab assignments. Exercises consist of a set of software operation instructions and questions that address the process and meaningful outcome. Each exercise is worth nine points; exercise questions are short answer worth 1-3 points each. In most cases the exercises will require more time to complete than available in two to three lecture periods dedicated to the lab assignments (~100 min), students should anticipate some additional time commitment. Exercises are due generally 7-10 days after they are assigned and submitted through D2L drop boxes as a Word document. Exercises not submitted by the dropbox due date will not be graded. Exercise outcomes will reviewed in lecture the week after the due date.

Exercise
Lab 1 Census and sustainability indicators
Lab 2 Landscape texture and classification
Lab 3 Urban morphology and sprawl
Lab 4 Detecting landscape categories with texture
Lab 5 Green infrastructure Neighborhoods: definition, delineation and
Lab 6 Transportation and emissions

Lab 7 Footprints, foodsheds and watersheds	
Lab 8 Bioregions, goods and services	

Exams: The midterm and final exams are each worth 15 points. These are mostly short answer with some T/F and multi-choice. Students receive a list of learning outcomes covered on the exam a week before the exam date. Example question will be introduced in lecture/lab presentations. Time management during the exams is important; delay will make it difficult to answer all questions completely. Students who do not take the midterm and final exams are not eligible for a passing grade.

Extra credit: Any student who wishes to improve their grade for a disappointing assignment or exam may request an extra credit assignment to make up for lost points. Extra credit points may not exceed the maximum points of the original assignment.

Evaluation: Final grades are based on points earned for successful completion of the lab exercises, and exams.

70%	Laboratory exercises - Eight exercises worth 9 points each.
15%	Midterm - 20 points.
15%	Final - 20 points

Grades for all assignments will be posted to D2L. Be aware that the total points for the lab assignments and exams is 100, each point is worth one percent of the final grade (See grading scale below). Grades will not be curved except in extenuating circumstances. All students are eligible to earn an A; grades are not competitive.

Grading scale:

Points	Grade
93-100	A 4.0
90-93	A- 3.7
87-89	B+ 3.3
83-86	B 3.0

80-82	B- 2.7
77-79	C+ 2.3
73-76	C 2.0
70-72	C- 1.7
66-69	D+ 1.3
60-65	D 1.0
0 - 59	F

Graduate 671 requirements: Expectations and requirements for graduate students are different The due dates, weights and grading scale for 671 are the same as 471 but the assignments and learning expectations are commensurate with graduate level studies. Lab assignments, midterm exam and final exam have additional or more challenging questions.

Plagiarism: Plagiarism is defined in <u>Chapter 14 of the UWSP Rights and Responsibilities</u> section14.03. You plagiarize if you use someone else's ideas, even if you paraphrase them, and do not cite them. All assignments submitted to D2L drop boxes are evaluated with Turnitin.com for plagerism. Answers to exam questions that are too similar to be clearly original work will not receive a grade. See <u>http://www.plagiarism.org</u> for more explaination and steps you can take to avoid plagiarism.

Disabilities: Students with disabilities or learning requirements of any nature should meet with the instructor during the first week of classes to address satisfactory accommodation.

"Simply put, the greater the student's involvement or engagement in the academic experience of college, the greater his or her level of knowledge acquisition and general cognitive development" (*How College Affects Students*, Pascarella and Terenzini, 1991)

Getting help and how to succeed:

Attend lecture & lab meetings: Regular lecture and lab section attendance is the single most effective investment toward success in Geog471. Lecture material builds upon and goes beyond the required readings as the foundation for the lab exercises. You should anticipate difficulty with timely completion of the lab exercises if you miss lecture/lab and do not recover.
Follow the learning outcomes: The learning outcomes listed on the lecture and lab pages are the take home concepts of the course. They are what you need to know to succeed with GIS and are the basis for the lab exercises and exams.
Notetaking: Taking notes during class meetings is a proven means of knowledge retention. Notes also help identify omissions and areas of difficulty during study and office hour consultations. Students are encouraged to share and compare notes with other students to improve understanding and learning.
Participate: You are *always* encouraged to participate in class and on the D2L discussion forums by asking questions and contributing observations and comments. Active participation will improve your learning quality, quantity and proficiency.

Meet with the instructor: The instructor is available to address your individual learning needs during office hours and by appointment. Scheduled office hours are open for drop-in consultation although prior scheduling is appreciated. Office hour topics include but are not limited to: a) further explaination of lecture material and lab exercises; b) software tech support; c) project design and troubleshooting; d) exam preparation; e) grading and evaluation discrepancies. Office hours and appointments are also open for study groups or project teams to focus on selected questions.

Submit assignments on time: Prompt submission of required assignments by their due date is required to receive credit.

Read the required readings: Do this before the lecture/lab when they are discussed. Familiarity with the required reading is expected and serves as the foundation for lecture presentations.

Exam preparation: Pay attention to the learning outcomes associated with the lectures and labs because these are basis midterm and final. Make sure you know what is expected and practice answering the sample exam questions provided.

Do your own work: Any lab exercise deliverable or exam question with answers that are too similar to others&' work to be unmistakably original will not receive a grade. Please take care to insure that your work is yours alone and not accessible to other students. All assignment deliverables are checked with Turnitin.com. See the section on plagiarism below.