

GEOG 5220 – Fundamentals GIS – Summer 2015

Instructor

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Office hours: Thursday 12:30 – 14:30 PM, or by appointment, or drop-in (my door is always open but I reserve the right to be busy)



Geographic information systems (GIS) allow us to visualize, analyze, and interpret complex spatial data in order to better address the social and environmental challenges that exist in our world. This course introduces principles of geographic information systems and their applications in spatial analysis and information management. The course is designed to give students an understanding of cutting-edge geospatial technologies, their capabilities, uses, and limitations, and this course can be used as a stand-alone course to complement other disciplines or as an entry-level course into a focused geospatial program.

Learning Goals

At the completion of this course, you will:

- Understand the fundamental value of GIS as a problem-solving tool.
- Recognize the unique characteristics of geographic data.
- Be comfortable representing geographic data in a GIS.
- Recognize the opportunities and obstacles for obtaining geographic data for a GIS.
- Demonstrate the ability to perform basic spatial analyses using a GIS.
- Be able to communicate geographic information using both written and graphical means.
- Be proficient in the basic operations of ArcGIS 10+ software.

Texts and online materials

[1] Longley, P. A., Goodchild, M. F., Maguire, D. J., & Rhind, D. W. (2015). *Geographic Information Science and Systems*: Wiley, **4th Edition**.

Lectures will cover the most of topics in this book but in a different fashion so the text serves as a true complement to enrich the lectures, and provide more detail.

[2] Law, M., & Collins, A. (2013). *Getting to Know ArcGIS for Desktop*: ESRI Press, **3rd Edition**.

This book will help you to grasp the basis hands-on GIS skills. Also it is a valuable reference whenever you meet difficulties in operating ArcGIS desktop.

Class material such as lecture notes, worksheets, additional readings will be made available through Carmen.

Evaluation

Standard OSU grading scale will be used for evaluation. Grading will be based on four elements:

- Participation, exercises, and quizzes (10%). There will be some in-class and/or take-home quizzes/exercises/readings during the semester. Your participation in these activities will also be used to count your attendance.
- Practical exercises (45%).
- Midterm exams (10%). There will be one midterm exam. It is a closed book exam and only the materials covered in the time before the midterm will be used in the exam.
- Group Design Project (20%). You will collaborate in small teams to create a GIS Project Design Report in which you will model the necessary steps to design and execute a GIS analysis for a hypothetical client. The project will include a written report and oral presentation.
- Final exam (15%). This will be a comprehensive exam with an emphasis on materials after the midterm exam.

Lectures and Homework

You are expected to attend lectures twice a week. Most classes have time allotted for discussions, in-class work and other activities. Your contribution in these and in class generally, will be noted, and used to determine part of your final grade; just showing up won't count a whole lot toward this component! Obviously, you will receive no credit for in-class work if you are not present.

During the semester, there will be several practical exercises. The main purpose of the exercises is to learn how to apply and reflect upon the things we cover during the lectures, and to grasp proficient hands-on skills of operating a GIS to solve real world problems. If you are having difficulty with these exercises you should ask for assistance, whether from fellow students, or from me. Whatever you do, ask someone but please note the academic integrity policy!

Attending class is important since these times provide you with access to the instructor and to other students. Keep in mind that not all assignments will be possible to finish in the allotted class time. Students will be expected to assignments outside of class during posted computer room hours. You are welcome to discuss the exercises amongst yourselves, in fact this is encouraged, but the final product you hand in *must be your own work* (see Academic Integrity Policy below).

Grading: we understand that many of the concepts and techniques discussed early in the course will be new. Recognizing this, the first few assignments will contain more detailed instructions.

All course works (practical exercises, group project work) are expected by the due date. A late penalty of at least 10 percentage units will be taken off each day after the due date.

If you have a genuine reason (known medical condition, a pile-up of due assignments on other courses, ROTC, athletics teams, job interview, religious obligations etc.) for being unable to complete work on time, then some flexibility is possible. However, if in my judgment you could reasonably have let me know *beforehand* that there would likely be a delay, and then a late penalty will still be imposed if I don't hear from you until *after* the deadline has passed. For unforeseeable problems, I can be more flexible. If there are ongoing medical, personal, or other issues that are likely to affect your work all semester, then please arrange to see me to discuss the situation. There will be NO make-up exams except for circumstances like those above.

Academic integrity is essential to maintaining an environment that fosters excellence in teaching, research, and other educational and scholarly activities. Thus, The Ohio State University and the Committee on Academic Misconduct (COAM) expect that all students have read and understand the University's *Code of Student Conduct*, and that all students will complete all academic and scholarly assignments with fairness and honesty. Students must recognize that failure to follow the rules and guidelines established in the University's *Code of Student Conduct* and this syllabus may constitute "Academic Misconduct."

The Ohio State University's *Code of Student Conduct* (Section 3335-23-04) defines academic misconduct as: "Any activity that tends to compromise the academic integrity of the University, or subvert the educational process." Examples of academic misconduct include (but are not limited to) plagiarism, collusion (unauthorized collaboration), copying the work of another student, and possession of unauthorized materials during an examination. Ignorance of the University's *Code of Student Conduct* is never considered an "excuse" for academic misconduct, so I recommend that you review the Code of Student Conduct and, specifically, the sections dealing with academic

misconduct.

What this really means is: If I suspect that a student has committed academic misconduct in this course, *I am obligated* by University Rules to report my suspicions to the Committee on Academic Misconduct. If COAM determines that you have violated the University's *Code of Student Conduct* (i.e., committed academic misconduct), the sanctions for the misconduct could include a failing grade in this course and suspension or dismissal from the University. Please do not put yourself in that situation.

If you have any questions about the above policy or what constitutes academic misconduct in this course, please contact me.

Other sources of information on academic misconduct (integrity) can be found on the Committee on Academic Misconduct web pages (oaa.osu.edu/coam/home.html)

Students with disabilities that have been certified by the Office for Disability Services will be appropriately accommodated, and should inform the instructor as soon as possible of their needs. The Office for Disability Services is located in 150 Pomerene Hall, 1760 Neil Avenue; telephone 292-3307, TDD 292-0901; <http://www.ods.ohio-state.edu/>.

Course Schedule*

Lecture: Tue & Thur 10:05 – 11:55AM Lab: Wed 12:10 – 14:00 PM

Week 1	Lecture: Tuesday June 16 Introduction to GIS	Lab: Wednesday Jun 17 Interacting with ArcGIS	Lecture: Thursday June 18 Representation
Week 2	Lecture: Tuesday June 23 Georeference	Lab: Wednesday Jun 24 Projections	Lecture: Thursday June 25 Vector Data
Week 3	Lecture: Tuesday June 30 Raster Data	Lab: Wednesday <i>July 1</i> [†] Spatial Operations	Lecture: Thursday July 2 Geodatabase, SQL, SpatiaLite
Week 4	Lecture: Tuesday July 7 Intro to Group Project, Mid-term	Lab: Wednesday July 8 Spatial Operation II	Lecture: Thursday July 9 Data Collection
Week 5	Lecture: Tuesday July 14 Networks GIS Ethics (Intro)	Lab: Wednesday July 15 Network Analysis	Lecture: Thursday July 16 System
Week 6	Lecture: Tuesday July 21 Emerging Topics in GIS	Lab: Wednesday July 22 Geospatial Big Data Analysis	Lecture: Thursday July 23 Discussion on GIS Ethics
Week 7	Lecture: Tuesday July 28 Managing GIS Projects	Lab: Wednesday July 29 GIS Project Presentation	Lecture: Thursday July 30 GIS Final Exam

* This is a tentative course syllabus; please check the Carmen frequently because materials listed in the schedule will be updated each week.

[†] Change to 14:00 - 16:00 PM.