

## Geog2011/Geog2011L: Introduction to Geographic Information Science

Fall 2017

**Instructor/contact information:** Dr. Jerry Shannon, [jshannon@uga.edu](mailto:jshannon@uga.edu), 706-542-1656

**Lecture:** 1:25-3:20 Monday, room 300A, Geography-Geology Building

**Labs:** 2:20-4:25 Wednesday, room 321; c: 13975 **OR** 10:10-12:05 Fridayday, room 153; c: 21016

**Office hours:** 10:30-12 Mon. or by appt., 112 Geography-Geology

**Teaching Assistant:** Taylor Hafley, [taylor.hafley@uga.edu](mailto:taylor.hafley@uga.edu)

**Schedule:** Available at <https://goo.gl/zDztc1>

### **Overview**

In the last thirty years, Geographic Information Science (GIScience) has become an increasingly common lens for studying our social and natural worlds. Whether the issue is containing disease outbreaks, predicting the impacts of climate change, or optimizing business locations, GIScience provides vital insights for crucial issues. At the same time, geospatial data is also increasingly abundant, from where you buy your food to whom you connect with on social media. These provide new ways of understanding social behavior but also raise concerns about institutional power and the surveillance society. Maps themselves, once painstakingly created by hand by trained cartographers, now are easily created by almost anyone using geographic information systems (GIS) software. Careers in GIS are traditionally at the top of lists of fastest growing jobs. GIScience has reshaped the way we think about our world.

This course introduces you to the tools, data, and uses of GIScience in contemporary society. We will begin by talking about the basics of mapping, how we create (usually) two dimensional representations of the earth's surface and what gets lost in the process. We'll then talk about what makes a *good* map, both one that's meaningful and well designed, as well as some of the ethical issues surrounding the use of maps and the collection of geospatial data. The massive amounts of geospatial data, from Twitter posts to satellite imagery, has prompted some to say we live in an era of "big data," and we'll try to understand what that means for spatial analysis. Lastly, we'll look at the ways GIS is used inside and outside the academy, from mapping the world as it was a century ago to current applications in health, climate, and urban and environmental planning. By the end of the course, you'll gain experience using a variety of GIScience tools to analyze spatial data and strengthen your understanding of the role spatial analysis plays throughout society.

### **Texts and software**

There's one required text for this course: *Making Maps* by Krygier and Wood (3rd edition). It's available at the UGA bookstore. You can also [rent or buy at Avid](#) (Athens' local bookshop) or find it on [Amazon](#). We'll be using this text quite a bit in the first half of the course. Additional readings will be available for download on ELC.

You'll be using multiple GIS software platforms this semester:

1. **Carto** is a web based mapping and data visualization system that provides free accounts. It's available at <https://carto.com>.
2. **QGIS** is an open-source, free desktop GIS software package. It's got much greater functionality than CartoDB and is similar to ArcGIS, which is the (rather expensive) industry standard. It runs on pretty much every operating system. It's available for download at <http://www.qgis.org>.
3. **Autodesk ReMake** is a software package for transforming 2d images to 3d models. It's available free of charge for students. Download it at <https://www.autodesk.com/education/free-software/remake>

You'll be able to access all this software in the lab, but it's also all free for you to run/install on your personal devices.

### **Assessment**

Class grades will be determined on a points system. You earn those points in multiple ways:

- Labs: **125 points** (5 labs, 25 points each). *Labs are due Fridays at 7 PM.*
- Exams: **80 points** (2 exams, 40 points each)
  - Exams will be completed **online** through ELC's Quizzes tool.
  - They will be open book.
  - Start the exam anytime between 9 am and 4 pm on the day noted on the schedule. You will have 45 minutes to complete the exam once you begin.
- Final project: **45 points**
  - Project proposal: 5 points
  - Final project: 40 points
- Class participation and attendance: **50 points**
  - Introductory survey: 5 points
  - Weekly reading responses on ELC: 20 points for > 80%, 10 points for > 50%
  - Sign in sheets at lecture/lab: 25 points for > 80%, 15 points for > 50%

Your grade will be based on how many of the 300 possible points you earn. This will be determined using a standard grading scale, with the following cutoffs:

<b>A</b> >= 275	<b>B</b> >= 245	<b>C</b> >= 215
<b>A-</b> >= 269	<b>B-</b> >= 239	<b>C-</b> >= 209
<b>B+</b> >= 263	<b>C+</b> >= 233	<b>D</b> >= 179

### **Online resources**

There's two main places to find course materials. UGA's [ELC system](#) is the place to go for course readings, post your weekly responses, and to turn in assignments. Basically, anything where your privacy or copyright matters. It's also got links to everything you'll need for the course.

All course materials (syllabus, lecture slides, and assignments) are hosted in the Google Docs system, and links to each will also be posted on ELC.

### **Attendance and participation**

As part of this course, you are expected to regularly attend class lecture and labs and keep up with course readings. To monitor attendance, sign in sheets will be used at lectures and labs. You'll receive full credit for signing in at 80% or more of classes, and a reduced number of points for between 50% and 80% of all sign ins.

For participation, you'll be responsible for posting a response to a weekly discussion prompt (usually about the readings) by **9 AM each Monday we have class** on the ELC discussion board. This post should be at least **100 words** in length. You will receive no credit for posts authored after the class time. You'll receive full credit for this activity if you participate more than 80% of the time, and half credit for more than 50%.

These policies allow for short illnesses or other emergencies. If you have circumstances that mean you'll be unable to participate for more than a week, please contact me ASAP. I'm much more open to making accommodations beforehand than I am weeks after the fact.

### **Contacting me**

Email is the best way to contact me, as I check it regularly throughout the work week and try to respond to any student emails within two business days. I am often around my office during the week, so you are free to call if needed. If you email me at night or on a weekend, don't expect a quick reply. You are also free to email the TA with questions, especially on issues related to the course lab assignments and final project.

### **Electronic Devices**

Please don't text, instant message, email, or post on social media during lecture and lab. Doing so is disrespectful and distracting for me and your classmates. While I allow laptops in class for note taking, I will ask you to put them away if they're being used for non class purposes. Limit phone calls to emergencies/urgent situations. In short, use common sense and don't be a distraction.

### **Late work**

All assignments are due on the week assigned by Friday evenings at 5 pm unless otherwise noted. Work submitted up to a week after the due date will be penalized by 10%. I will not accept any assignment that is more than one week late. If you have an exceptional situation that will require more than a week's grace period, please notify me as early as possible, and we can discuss it.

### **Scholastic Dishonesty**

Plagiarism is a serious offense anywhere, but especially so in a university environment. Any assignment that uses another's work without proper acknowledgement will be penalized.

Plagiarism that is clearly intentional and extensive will result in a failing grade for the course. For more information on academic honesty policies at UGA, see <http://honesty.uga.edu>

### **Special Needs**

Any student with a documented disability condition should contact me at the beginning of the semester to arrange accommodations. Please note that these cannot be made retroactively. You may also wish to contact the Office of Disability Services at 542-8719, and/or the Learning Disability Center at 542-4589.

### **Grade Disputes**

If you feel that an assignment or exam has not been graded fairly, contact me within a week of receiving the disputed grade. You should provide substantive reasons for your dispute, such as a justification for the response in question. I will respond to any such requests promptly.

If you'd like to review your answers for an exam or reading quiz, just go back to the Quizzes section of ELC, click on the arrow next to the exam/quiz name, and choose Submissions. Then click on Attempt 1. Your incorrect responses should be visible once I release them, when everyone has completed the quiz/exam.

### **Bibliography**

- Crampton, Jeremy W. 2010. *Mapping: A Critical Introduction to Cartography and GIS*. Chichester U.K.: Wiley-Blackwell.
- Gibson, E. 2016. Empowering Citizens. *ArcUser*, 22–25.
- Goodchild, Michael F. 2010. "Towards Geodesign: Repurposing Cartography and GIS?" *Cartographic Perspectives* (66):7–21.
- Jouvenal, Justin. 2016. "[Police Are Using Software to Predict Crime](#)." *Science*
- Krygier, John, and Denis Wood. 2016. *Making Maps: A Visual Guide to Map Design for GIS*. 3rd ed. New York: Guilford Press.
- Lani Stelle, Lei. 2015. "[GIS Makes Citizen Science More Accessible](#)." *ArcNews*.
- Lozano, P. C. 2016. Less in Space. *American Scientist*.
- Marshall, Aarian. 2015. "[Why Most Twitter Maps Can't Be Trusted](#)." *Atlantic CityLab*.
- Masunaga, S. 2016. Small satellites are back, with down-to-earth expectations. *Los Angeles Times*. Retrieved from <http://www.latimes.com/business/la-fi-adv-small-satellites-20160519-snap-story.html>
- Miller, Jane E. 2015. *Chicago Guide to Writing about Numbers*. 2nd ed. Chicago: University of Chicago Press.
- Meyer, R. (2015). The Internet Mapmakers Helping Nepal. Retrieved March 10, 2017, from <https://www.theatlantic.com/technology/archive/2015/05/the-mapmakers-helping-nepal/392228>
- Naughton, John. 2014. "[We're All Being Mined for Data – but Who Are the Real Winners?](#)" *The Guardian*.
- O'Neil, C. 2016. *Weapons of math destruction how big data increases inequality and threatens democracy*. New York: Crown.
- Zook, Matthew et al. 2015. "[What Would a Floating Sheep Map?](#)" Lexington, KY: Oves Natantes Pres.

Last updated: 9/22/17					
		<b>Monday (1:25-3:20)</b>	<b>Wednesday Lab (2:20)</b>	<b>Friday Lab (10:10)</b>	<b>Assignment due (Friday @ 7 PM)</b>
Aug 14-18		Course overview; Overview of GIScience	Filtering data and using formulas to summarize in Excel		
Week 1		<i>No reading</i>			
Aug 21-25		[Online lecture] Descriptive statistics (includes ELC responses)	Mapping with Carto		<u>Introductory survey</u>
Week 2		<i>Reading: None</i>			
Aug 28-Sept 1		Critical GIScience; Projections	Introduction to QGIS: Loading and exploring data		Lab 1: Describing and mapping daymet data
Week 3		<i>Reading: Crampton (Ch. 2); Krygier/Wood (chap. 5)</i>			
Sept 4-8		<b>NO CLASS: Labor Day</b>	Projections; Calculating fields in QGIS; Print composer		
Week 4					
Sept 11-15		<b>NO CLASS: Weather cancellation</b>	Downloading and joining data from NHGIS		Lab 2: Analyzing UGA enrollment
Week 5					
Sept 18-22		Geographic Data; Color and symbolization	Descriptive stats in QGIS; Modifying layer boundaries		
Week 6		<i>Reading: Krygier &amp; Wood (chap. 3, 10, and 12)</i>			
Sept 25-29		Data classification; Map and data scales	Open lab work day (optional)		
Week 7		<i>Reading: Krygier/Wood (chap. 8)</i>			
Oct 2-6		Big data; Twitter and VGI; Exam overview	Planning for VGI data collection		Lab 3: Mapping Manufacturing
Week 8		<i>Readings: Naughton; O'Neill (Ch. 3)</i>			
Oct 9-13		<b>Exam 1: On ELC. Optional review session @ 1:25</b>	Finishing data submission for the VGI project		VGI data submission
Week 9		<b>Exam available from 9 am - 4:30 pm</b>			
Oct 16-20		Open data, PPGIS, and OpenStreetMap	Mapping our course data on Carto (+ ReMake for Friday lab)		
Week 10		<i>Readings: Gibson; Meyer</i>			
Oct 23-27		Drone demonstration; Photogrammetry and remote sensing	Using ReMake; Structure from Motion	<b>NO CLASS: Fall break</b>	Lab 4: Mapping the campus (due Thursday, 10/26)
Week 11		<i>Reading: Madden et al. and rules about UAS flights</i>			
Oct 30-Nov 3		Applying GIS: Health; Guest speaker: Dr. Mu	DEM data and 3d models in QGIS		
Week 12		<i>Reading: TBD</i>			
Nov 6-10		Applying GIS: Crime; Guest speaker: David Griffith, ACCPD	Refresher on NHGIS; Finalize variable/year options (each lab nominates 2)		Lab 5: GIS in 3D
Week 13		<i>Reading: Jouvenal; O'Neil (Chap. 5)</i>			
Nov 13-17		Applying GIS: Urban Planning; The Cubesat program	Proposal work time		Project proposal
Week 14		<i>Reading: Goodchild; Lozano and Masunaga</i>			
Nov 20-24		<b>THANKSGIVING BREAK</b>			
Nov 27-Dec 1		The GIS Industry; Countermapping	Project work time (optional)		
Week 15		<i>Research a GIS company (handout); Reading: Zook, et al</i>			
Dec 4-5		Course wrap up	LAB ON TUESDAY!!		Final project due (Tues.)
Week 16			Project work time (optional)		
<b>Finals week</b>		<b>Exam 2: On ELC from 9 am - 4:30 pm. Optional review session @ 1:30 pm in Geography 300A (lecture room)</b>			