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GIScience 1 UO Geography 4/581

Fall 2018

GIScience I: Syllabus

If you prefer a more portable digital copy of any of the materials listed below, use your web browser's print-to-PDF functionality.

Description

This class is an introduction to concepts behind organizing, analyzing, and visually presenting geospatial information. This class addresses three major questions:

1. How can one sense and represent the variation in the world around us?
2. How to record, recall, and analyze this information?
3. How to communicate and discuss this information with others?

GIScience I explores these questions though the applied use of software designed to facilitate the collection, analysis, symbolization, and communication of information about the world; that is to turn observations of the real world into information useful for acting in the real world. This is often done with maps, and much of the work will involve the creation of maps.

Objectives

After completing this course, students should be able to:

- Plan and execute basic GIS analysis using a software application framework.
- Communicate the results of an analysis through language and graphics.
- Articulate the characteristics of and differences between data representations.
- Identify and critique choices that are made in map design.
- Critically evaluate geospatial arguments in popular media.
- Develop skills in information-seeking.

Resources

Links:

- *Class materials*: https://DavidJRichey.github.io/UO_Geography_4-581/

Instructors

- *Course/lecture*: David Richey
  - Email: richey.david.j@gmail.com
  - Office hours: MW 10-11 am, 245 Columbia (map)
- *Lab*: Riley Anderson
  - Email: roa@uoregon.edu

    - Office hours: TBA, Reed Seminar Room Knight Library(map)
- *Lab*: Antoine Nzeyimana
    - Email: anzeyima@uoregon.edu
    - Office hours: TBA, Reed Seminar Room Knight Library(map)

Texts

- *Geographic Information Science and Systems*, Fourth Edition (2015), by Longley, et al.
- Various in-lab supplemental reading, from the ArcGIS Desktop Documentation: https://desktop.arcgis.com/en/documentation/.
- *Supplemental reading will be available via links in schedule or the Canvas class site.*

Locations

- *Lecture*: 221 McKenzie Hall (map)
- *Lab*: Social Sciences Instructional Laboratory (SSIL), 445 McKenzie (map)

Grading

- 10% — In-class activities. Due at the end of classtime.
- 40% — Lab assignments. Due at the start of the next lab's session.
- 30% — Tests: Two will be conducted, in-class. Due at the end of classtime.
- 20% — Final project. Due on the date/time of our scheduled finals time.

Late work will be reduced in value by 10% per day late. No late tests or final projects will be accepted.

Students will be graded based on percentages of the total points—the class is not graded on a curve. Grading will follow the Department of Geography's standard grading rubric:

- **A+** — Only used when a student's performance significantly exceeds all requirements and expectations for the class. Typically very few to no students receive this grade.
- **A** — Excellent grasp of material and strong performance across the board, or exceptional performance in one aspect of the course offsetting somewhat less strong performance in another. Typically no more than a quarter of the students in a class receive this grade, fewer in lower-division classes.
- **B** — Good grasp of material and good performance on most components of the course. Typically this is the most common grade.
- **C** — Satisfactory grasp of material and/or performance on significant aspects of the class.
- **D** — Subpar grasp of material and/or performance on significant aspects of the class.
- **F** — Unacceptable grasp of material and/or performance on significant aspects of the class.

In-class activities

During some classes, we will pause the lecture to do an in-class activity of some sort. These will be interactive: the activity will involve the entire class or a small group. Each person will turn in a paper with some responses related to the activity, so be sure to have paper on hand.

Activities will relate directly to the lecture subject. They will not be hard: just engage the group and the content, and you will earn your points.

Lab Sections

There are four lab sections for the course. Each lab assignment will made be available by the applicable lab session. During the lab section you have registered for, the SSIL computer lab is reserved for your use and a GE will be available to present material and answer questions.

If there is space available in the other sections—and the GE for it gives their permission—you may sit in as a guest. Please understand that the GE must prioritize the students registered for that section.

Plan ahead, and **save often** while working; computers and software can be unpredictable and crash when one least expects (or wants). Please save your lab files to your student folder on the SSIL server. Feel free to save copies elsewhere.

Most lab assignments will be due at the start of the lab the next week. The exception for this is Lab 7, which will be due in two weeks. You will turn in your lab work digitally via Canvas. Be sure to turn them in before or within the first ten minutes of the lab on their assigned due date.

Assignments may often require extra work outside normal lab hours to complete. Be proactive in ensuring you have access to the tools required to complete it on time, whether that be extra SSIL time or software, VPN, and Canvas access when required.

Lab 7 is twice as much of your grade as the other labs are. Doing the math, Labs 1-6 are 5% each of your class grade; Lab 7 is 10%.

There is a handy "Lab 0" document that can familiarize you with the filesysyem and servers in the SSIL computing environment, available on the class website.

Tests

Tests will not be cumulative, and will directly relate to content covered in the lecture portion of the class.

Final Project

- Proposal (PDF)—(DOCX)—(ODT)—(RTF)
- Topic Ideas
- Worksheet (PDF)—(DOCX)—(ODT)—(RTF)
- Worksheet—Peer Feedback

In lieu of a lab in the final weeks of the term and cumulative final, students will undertake a final project, to be completed by the end of the time a final exam would be scheduled if we had one (Wednesday December 5th at 10:15 am).

The project will be not unlike the labs you will have completed, except the data, analysis, and products of it will be designed by you rather than the instructor. As you progress through the class, be thinking about possible topics for your final project.

In week 7, we will discuss the project in detail, and do an in-class activity related to fine-tuning ideas. A 'proposal', outlining your intentions for the content of the project is due at the beginning of week 10.

Graduate students will have two additional components to their final project. The first is a description of the analysis you did (4-10 pages), or a related literature review to the subject matter. Be sure to provide citations and reasoning for your methodology. The second is to present your project briefly in the last week of class.

Schedule

Week 1

- **Reading**:
  - Longley et al Chapters 1 & 2 (sections 2.3+ optional).
- **Lecture**:
  - Mon September 24 — Lecture 1: Class introduction.
  - Wed September 26 — Lecture 2: What Is GIS?
- **Lab**:
  - Lab 0: Filesystem and Servers in SSIL
  - Lab 1: Using GIS with ArcMap and SSIL

Week 2

- **Reading**:
  - Longley et al Chapters 3 & 4.
- **Lecture**:
  - Mon October 1 — Lecture 3: Spatial representation; georeferencing.
  - Wed October 3 — Lecture 4: Coordinate systems and projections.
- **Lab**:
  - Lab 2: Projections.

Week 3

- **Reading**:
  - Longley et al Chapter 7.
- **Lecture**:
  - Mon October 8 — Lecture 5: Geospatial data models.
  - Wed October 10 — Lecture 6: Attribute data—Types & queries.
- **Lab**:
  - Lab 3: Spatial Data Types and Querying Values.

Week 4

- **Reading**:
  - Longley et al Chapter 13 (sections 13.3.4+ optional); Chapter 14 (section 14.4+ unnecessary).
- **Lecture**:
  - Mon October 15 — Test 1 (covers lectures 1-6).
  - Wed October 17 — Lecture 7: Combining data—Attribute joins & spatial analysis.
- **Lab**:
  - Lab 4: Spatial Selection and Attribute Queries.

Week 5

- **Reading**:
  - "ArcGIS Desktop: Analysis toolbox" (overview section plus each toolset subsection).
    - https://desktop.arcgis.com/en/arcmap/latest/tools/analysis-toolbox/an-overview-of-the-analysis-toolbox.htm
  - Longley et al Chapter 15.
- **Lecture**:
  - Mon October 22 — Lecture 8: Spatial analysis—A look in the toolbox.
  - Wed October 24 — Lecture 9: Spatial modeling.
- **Lab**:
  - Lab 5: Site Selection—Tsunami Relief Center.

Week 6

- **Reading**:
  - Longley et al Chapter 11.
  - Axis Maps, "Thematic Cartography Guide." (can skip over projections section)
    - https://axismaps.github.io/thematic-cartography/
  - Buckley, "Make Maps People Want to Look At" in ArcUser, Winter 2012.
    - https://www.esri.com/news/arcuser/0112/files/design-principles.pdf
- **Lecture**:
  - Mon October 29 — Lecture 10: Maps — Elements, symbolization, classification..
  - Wed October 31 — Lecture 11: Maps II — Visualization & design..
- **Lab**:
  - Lab 6: Working with Raster Data—Elevation.

Week 7

- **Reading**:
  - Longley et al Chapter 8.
  - Christian Kreibich, "How to ask for datasets."https://medium.com/@ckreibich/how-to-ask-for-datasets-d5ef791cb38c
  - Esri Training Matters, "Use the Five-Step GIS Analysis Process."
    - https://blogs.esri.com/esri/esritrainingmatters/2009/10/08/use-the-five-step-gis-analysis-process/
- **Lecture**:
  - Mon November 5 — Lecture 12: Data collection—Where do I get data?
  - Wed November 7 — Lecture 13: Final project—Introduction & worksheet peer review.
- **Lab**:
  - Lab 7: Vegetation Land Cover Report (due in two weeks).

Week 8

- **Reading**:
  - None.
- **Lecture**:
  - Mon November 12 — Lecture 14: Project Mangement.
  - Wed November 14 — Test 2 (covers lectures 7-14).
- **Lab**:
  - Lab 7: Vegetation Land Cover Report (continued from previous week).

Week 9

- **Reading**:
  - *TBA*.
- **Lecture**:
  - Mon November 19 — TBA
  - Wed November 21 — Lecture 15: Wrap-up.
- **Lab**:
  - Final project: Work on in lab session.

Week 10

- **Reading**:

    - None.
- **Lecture**:
    - Mon November 26 — Lecture 16: Graduate student project presentations.
        - Final project proposal due.
    - Wed November 26 — Lecture 17: Graduate student project presentations.
- **Lab**:
    - Final project: Work on in lab session.

Finals Week

- **Final project due Wednesday December 5th at 10:15 am.**

Student Responsibilities

Conduct

The University Student Conduct Code (available at https://dos.uoregon.edu/conduct) defines academic misconduct. Students are prohibited from committing or attempting to commit any act that constitutes academic misconduct. By way of example, students should not give or receive (or attempt to give or receive) unauthorized help on assignments or examinations without express permission from the instructor. Students should properly acknowledge and document all sources of information (e.g. quotations, paraphrases, ideas) and use only the sources and resources authorized by the instructor. If there is any question about whether an act constitutes academic misconduct, it is the students' obligation to clarify the question with the instructor before committing or attempting to commit the act. Additional information about a common form of academic misconduct, plagiarism, is available at researchguides.uoregon.edu/citing-plagiarism.

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