Web Mapping and Map Servers Summer 2016

(GUS 8068, GUS/ES4000)

**Instructor**: Dr. Ryan Burns Office hours: Tues/Thurs 11:30-1:30, by appt.

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**Meets:** T/R 1:30-4:30, Anderson 103

***Information on this course, including general information, lecture slides, lab assignments, and other information is available on Blackboard.***

# General Information

1. **Purpose of the Course**

In 2016, increasing amounts of geographic information are delivered over the web. No longer is it enough for activists, administrators, analysts, and researchers to understand the processes of making desktop-software maps. New patterns of communication necessitate critical thought regarding – and effective use of – collecting, analyzing, and visualizing information on the web.

In this course, we will explore theoretical and practical concepts of web mapping. From a theoretical perspective we will study advantages and techniques for publishing, visualizing and accessing maps and data on the Internet. This entails examining architectures of Web GIS/Web mapping systems, markup languages (e.g. HTML, XML, and KML), scripting languages, screen cartography, data sharing, and geoportals. We will also develop some ways of thinking about the social, political, and economic impacts of web mapping as a set of practices and knowledges. From a practical perspective you will learn to develop Web mapping applications including static and interactive platforms. You will also learn and work with some well-known open source software and libraries.

1. **Prerequisites**

As this course requires advanced manipulation and display of spatial data, Fundamentals of GIS is required. In our discussions it will be assumed that you already have the skills and knowledge gained in that course.

1. **Attendance**

The labs are written without detailed instructions purposefully so that students are required to solve analytical problems using your own knowledge. It is nearly impossible to complete the lab assignments without guidance from the instructor. Thus, prolonged absence from class will likely affect your grade, inhibit your understanding of the lecture material, and prevent you from receiving help on the lab assignments.

Because of the highly irregular, idiosyncratic, and complex nature of scripting and web development, *technical questions will only be answered in person – they will not be answered via email*. Let me say this again: questions of a technical nature (i.e., troubleshooting, syntax-checking, “my map isn’t showing up”, etc.) will *not* be answered via email.

1. **Text**

Occasional required readings will be posted on Blackboard and handed out in class.

There is a **recommended** text for the course:

*Getting to Know Web GIS* (2015) by Pinde Fu, published by Esri Press. This text describes much of the technical material covered in the course.

1. **Grading**

|  |  |
| --- | --- |
| Undergraduates  Participation 10%  Midterm Exam 20%  Final Projects 20%  Lab Exercises 50% | Graduates  Participation 10%  Midterm Exam 20%  Final Projects 15%  Lab Exercises 45%  Reflection Paper 10% |

The exam will include information covered in the lecture, lab, and all other portions of the course up to the time of the exam. Make-up exams will be given only for documented medical emergencies.

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| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **A** | 92-100 | **B+** | 88-89.9 | **C+** | 78-79.9 | **D+** | 68-69.9 | **F** | <60 |
| **A-** | 90-91.9 | **B** | 82-87.9 | **C** | 72-77.9 | **D** | 62-67.9 |  | |
|  | | **B-** | 80-81.9 | **C-** | 70-71.9 | **D-** | 60-61.9 |

1. **Lecture**

The first half or so of each class will be devoted to lecture. The lecture is intended to be an interactive environment, and the “success” of each meeting will be largely dependent on your participation! My lecturing style is highly conversational, so please be ready to contribute. During this time we will discuss any readings that have been assigned. Your participation grade will be dependent on your joining in to answer questions, discuss readings, and come prepared for class.

1. **Lab**

The remainder of each class following the lecture will be devoted to lab and final projects. During this section, students work on lab assignments that provide practical experience in applying the concepts learned in lecture. This is the time in which you should ask any technical questions you have.

1. **Disabilities**

Any student who has a need for accommodation based on the impact of a disability should contact Disability Resources and Services at 215-204-1280 in 100 Ritter Annex to coordinate reasonable accommodations for students with documented disabilities. Their office will convey your needs to me, but please feel welcome to speak with me privately, as well – my door is (metaphorically) open.

1. **Well-being**

College can be stressful, and your mental well-being is important. If you are a student of Temple University, Tuttleman Counseling Services offers you support for your emotional, educational or vocational concerns. Assistance is *confidential* and free of charge. They provide an atmosphere that is informal and professional, where you can feel safe and comfortable seeking help. Find them at 1810 Liacouras Walk (5th floor) or call them at (215) 204-7276.

Your academic advisors can be great advocates for you. While I expect that you will all make an effort to keep me informed if you will be absent, or ask for help if you are struggling, your advisor also can help you find the people at the university that you need to talk to if you have an unexpected life event.

1. **Academic Dishonesty**

Academic dishonesty (i.e. cheating on tests, copying another student's assignments, plagiarism, etc.) will not be tolerated. Please refer to this statement for more information on Temple University's Academic Honesty policy: <http://www.temple.edu/pharmacy_qara/plagiarism.htm>. Please feel free to talk with me if such policies are unfamiliar to you.

1. C**lassroom Environment**

All persons participating in the course should be respectful of other students and the instructor in order to facilitate a civil learning environment. All persons participating in the course have a right to expect respectful treatment in the classroom.

1. **Statement on Academic Freedom**

Freedom to teach and freedom to learn are inseparable facets of academic freedom. The University has adopted a policy on Student and Faculty Academic Rights and Responsibilities (Policy # 03.70.02) which can be accessed through the following link: <http://policies.temple.edu/getdoc.asp?policy_no=03.70.02>

# Lab Information

1. **Introduction**

The latter portion of each class will be devoted to 'lab' where you will be expected to complete a lab assignment. You may work on these assignments within class or outside of class. However, you can only expect assistance during this time or during office hours. All computer labs administered by the College of Liberal Arts (see **http://www.temple.edu/clait/labs/index.html** for CLA labs), offer access to the GIS software and data used for the course, including the large drop-in lab located in the lobby of Anderson Hall. The TECH center also hosts GIS software.

1. **Lab Reports**

Each lab contains an assignment which you are expected to complete. This assignment will be focused on an analysis task. You should approach these lab reports as deliverables to stakeholders who are not in any way associated with this course. In other words, jargon should be minimized and explained, you should reference “this analysis” or “this project” rather than “this lab”, and the writing should be as active and engaging as possible.

For each lab assignment you must hand in a brief report as a Word file via Blackboard – click on the assignment in Blackboard and upload your file. ***Do not email me your report.*** I will grade and make comments on your report where applicable, and you can access the commented report via Blackboard.

This report must be approximately 1-2 pages in length (of text), single spaced, 12 point TIMES NEW ROMAN\* FONT, with one inch margins, and indented paragraphs. It should have your name, date, and lab assignment number (e.g. Lab 1) at the top of the page. It must also include a link to your web map. It should be written according to standard writing practices – as much as I love dropping emojis into my Twitter and Facebook communication, those shouldn’t go here! Points will be deducted for not formatting your lab report correctly.

\*=other acceptable fonts: Garamond 12-point, Cambria 11-point.

The report must contain the following five sections, and the name of the section must appear in bold at the top of each section:

1. Introduction
2. Methods
3. Results
4. Conclusion
5. Tables and Figures

The **introduction** section should state the objective - what you are trying to accomplish in your assignment. It should also provide some context as to why it’s an important topic. Here, your objective is the goal of your analysis/project, not the learning objective. *The introduction should NOT (NOT) state that your objective is 'to learn GIS' or something similar!*

The **methods** section should state how you did the analysis, what analytical steps you took to complete the assignment. This section does not need to state every drop down menu item you selected or every button you pushed, but should summarize what analytical operations you used. For this you should use the precise terms (e.g., geoJSON, vector tiles, Leaflet) we have used in class, but again, explaining jargon where necessary.

The **results** section should report the results of your analysis, and some interpretation. This section is often very brief, as it should be devoid of substantial commentary or reflection. What does your map show? Are there any insights to be garnered from your visualization?

The **conclusion** section should offer some reflection and commentary on your results as well as report on any assumptions and limitations of your analysis and what other steps could be taken to improve the analysis. The conclusion should *not* detail only your map’s limitations.

In addition, the lab may require the creation of maps, tables, and/or charts, as specified in the lab assignment. These graphics should be appended onto the end of the report and referred to in the text.

For help with writing visit the *Temple University Writing Center*. For information visit them on the web at [**http://www.temple.edu/writingctr/**](http://www.temple.edu/writingctr/).

1. **Due Dates**

Due dates are indicated at the top of the lab assignment, and will be the Friday of the week listed in the calendar below. Deadlines are firm.

1. **Working with Other Students**

I encourage students to work together on lab assignments and assist each other in understanding the course material. However:

**all contents of each student's lab reports (text and graphics) must be authored solely by that student.**

1. **Grading**

Each lab will be graded out of 20 points.

Labs will be graded based not only on whether you ‘get the right answer’, but also on your ability to express yourself in a coherent fashion through both writing and graphics (i.e. maps).

***If a lab report is turned in late, 4 points will be deducted from that lab grade. No labs will be accepted more than two weeks after their due date.***

1. **Data**

Each lab assignment will indicate how to access data for that lab assignment. Labs will typically take longer than one or two lab session to complete, so you will need to save incomplete labs so that you may continue to work on them at another time. **It is the student's responsibility to understand how data and projects are saved, and to manage and back up their own data and assignments.** **I suggest using GitHub – either starting your own Github page (recommended!) or using the one we have designated for the course.**

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# Course Schedule

(Note: This is a general plan. The day-to-day topics and lab dates may change as we proceed through the semester).

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| --- | --- | --- | --- |
| Date | **Topic** | **Lab** | **Other** |
| May 10 | Mashups and non-programming web maps | Lab 1 | Javascript intro |
| May 12 | Web cartography, mobile screens | Github, Esri UN |
| May 17 | More Javascript | Lab 2 |  |
| May 19 | Web GIS architecture, web application tiers | Form final group |
| May 24 | Markup languages, markdown, geoJSON | Lab 3 |  |
| May 26 | Data sharing and geoportals |  |
| May 31 | Midterm | Lab 4 |  |
| June 2 | Vector tiles | Proposal due |
| June 7 | Servers, APIs | Lab 5 |  |
| June 9 | WMS/WFS, APIs |  |
| June 14 | TopoJSON | Lab 6 |  |
| June 16 | Digital humanitarianism; **student presentations** | Student presentations |