

**GEOSC 497C**  
**Making Geologic Maps with ArcGIS**  
**Spring 2016**  
**Room 210 IST**

**Instructors**

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**Course Description and Overview**

This course provides an introduction to Geographic Information Systems (GIS) and their use in making geologic maps. Students will gain proficiency in ArcGIS through hands-on experiences with raster and vector data input, photo-geologic interpretation, creating a database, managing attributes, and data exploration and analysis. This is designed for upper level geosciences majors who will take Geosc 472 in summer 2016. However, if you have taken or plan to take Geosc 340 (Geomorphology) in spring 2016, this course will be redundant.

**Assignments and Grading**

Our meeting schedule is outlined below. You will have an assignment each class period that will be due before the following meeting and submitted to us using Angel. We will review each assignment, make comments, and post the document and grade to Angel. It is your responsibility to make the suggested changes (even if you received an A!) to improve your skills and because you do not want to propagate errors to your final project.

60% **Labs:** A maximum of 10 points can be earned for each lab.

40% **Final:** You are expected to take the comments we provide for you and make any edits suggested. Your final will be a culmination of your lab work and will include a geologic map, cross-section, legend, 3-D rendering of the location, and a short (~4 page) write up about interpreting the landscape based on the data you collected throughout the semester. You will receive a more detailed handout about the final mid-way through the class.

**Course Materials**

Datasets, readings, and manuals will be provided.

**Academic Integrity**

The only way for you to learn how to function in ArcGIS is to complete each lab on your own. You will not be assigned or allowed to work with others. However, you are encouraged to seek help if needed, first by searching the ArcMAP help function, googling, asking a classmate, or asking us if you are not able to resolve your problem.

You will be penalized for cheating. Students who present other people's work as their own will receive a 0 on the assignment and may receive an F in the course. For more details, please see: Earth and Mineral Sciences Academic Integrity Policy, which this course adopts:  
[http://www.ems.psu.edu/current\\_undergrad\\_students/academics/integrity\\_policy](http://www.ems.psu.edu/current_undergrad_students/academics/integrity_policy)

### **Attendance Policy**

Since we are only meeting 7 times throughout the semester your attendance is mandatory. If for some reason you must miss a class, we need to know PRIOR to the start of class. You will not pass this course if you miss more than **1** lab.

Whenever possible, students participating in University-approved activities should submit to the instructor a Class Absence Form available from the Registrar's Office: [http://www.registrar.psu.edu/student\\_forms/](http://www.registrar.psu.edu/student_forms/), at least one week prior to the activity.

Some relevant information on PSU attendance policies:

Attendance Policy 42-27: <http://senate.psu.edu/policies/42-00.html#42-27>

Attendance Policy E-11: <http://www.psu.edu/oue/aappm/E-11.html>

Conflict Exam Policy 44-35: <http://www.psu.edu/ufs/policies/44-00.html#44-35>

Illness Verification Policy: <http://studentaffairs.psu.edu/health/welcome/illnessVerification/>

Religious Observance Policy: <http://www.psu.edu/oue/aappm/R-4.html>

Office of Student and Family Services: <http://studentaffairs.psu.edu/familyservices/>

### **Accommodations for students with disabilities**

Penn State welcomes students with disabilities into the University's educational programs. Every Penn State campus has an office for students with disabilities. The Office for Disability Services (ODS) website provides contact information for every Penn State campus: (<http://equity.psu.edu/ods/dcl>). For further information, please visit the Office for Disability Services website (<http://equity.psu.edu/ods>).

In order to receive consideration for reasonable accommodations, you must contact the appropriate disability services office at the campus where you are officially enrolled, participate in an intake interview, and provide documentation based on the documentation guidelines (<http://equity.psu.edu/ods/guidelines>). If the documentation supports your request for reasonable accommodations, your campus's disability services office will provide you with an accommodation letter. Please share this letter with your instructors and discuss the accommodations with them as early in your courses as possible. You must follow this process for every semester that you request accommodations.

### **Weather Delays**

Campus emergencies, including weather delays, are announced on Penn State News: <http://news.psu.edu/> and communicated to cellphones, email, the Penn State Facebook page, and Twitter via PSUAlert (Sign up at: <https://psualert.psu.edu/psualert/>).

## Schedule

Class	Date	Topic
1	14-Jan	<b>Course Overview, Expectation, Schedule, Grading</b> What is GIS: learning how to view the world What is ArcMap and Arc Catalog? Setting up your GIS workspace: loading data and viewing Knowing what projection you are in and how to change it Assignments & schedule until next meeting
2	18-Feb	<b>Building Familiarity with the ArcGIS Environment: RASTER Data</b> Downloading data Creating hillshades, slope maps, and visualizing raster data (ArcScene) Symbology and shading Creating a Map Layout, Printing, and Exporting <i><b>Deliverable due 24-Feb = Overview Map &amp; Arc Scene Rendering</b></i>
3	25-Feb	<b>Building Familiarity with the ArcGIS Environment: VECTOR Data</b> Creating a geology database (feature classes, topology, etc.) Determining mapping units Point, line, and polygon feature editing Practice editing vector data <i><b>Deliverable due 2-March = Geodatabase check</b></i>
4	3-Mar	<b>Adding field data to a geology map</b> Adding XY data to a geology map & labeling (strike & dips) Adding feature datasets to your geodatabase (observations, GPS tracks) <i><b>Deliverable due 16-March = Field data added, rotated, labeled</b></i>
5	17-Mar	<b>Aerial Photo Interpretation and Geologic Mapping</b> How to interpret landscape features using aerial imagery Describing geologic units using only aerial imagery <i><b>Deliverable due 31-March = Geologic map progress!</b></i>
6	7-Apr	<b>Creating a Geologic Cross Section</b> Downloading tool bar for ArcMap Vertical exaggeration and strike and apparent dips <i><b>Deliverable due 20-April = Geologic Cross Section - clean &amp; labeled</b></i>
7	21-Apr	<b>Layout and printing</b> How to present your mapping and make it look good <i><b>Deliverable due 29-April = Final Geologic Map, Cross Section, Arc Scene, Legend, Geology report</b></i>