SYLLABUS: GEOLOGY 275- – Geologic Data and Analysis
Fall 2013

CRN: 613 ***Credits****:* 4.0
Lecture meets: MWF 12:00 pm-12:50 pm; ***Lab meets***: W 01:00 pm-02:50 pm
Prerequisites: Math 105 (or equivalent) and a GEOL 1XX course

Textbook: (*required*): Rite in the Rain All Weather Geological Field Book, (see http://www.amazon.com/Rite-Rain-Weather-Geological-Field/dp/B0011DGJSC for example)
Optional textbook: *Geology in the Field*, by Robert Compton (John Wiley and Sons, 1985; ISBN: 0-471-82902-1). While somewhat dated, this text provides a wealth of standard approaches to geologic data description and collection. There will be handouts provided during the course via Angel which give background and overviews of mapping methods and techniques.

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Course Description (from the Undergraduate Catalog): "An examination of field and remote sensing techniques for gathering spatially distributed and oriented geologic data and common techniques for the preparation, analysis and presentation of these data. Brunton compasses, handheld GPS units and simple surveying tools will be utilized in collection of field data. Construction of GIS maps, using a variety of bases (*e.g.*, topographic maps, aerial photos, satellite images, etc.) and geologic interpretation of mapped data will be a central focus of laboratory activities."

Course Overview: This course focuses on the collection of field data and how to organize, visualize, and analyze this data in a computer environment. Thus, this course will move back and forth between field data collection and the computer. Brunton compasses, handheld GPS units, digital photographs, surveying tools, and of course, *your eyes*, will be utilized to collect field data. Students will develop skills in identifying and describing geologic materials and topographic features. Students will develop good field note taking habits, and learn how to make field observations. They will construct maps in the field, and overlay field data in a GIS environment in the lab (*e.g.*, overlaying topographic maps, aerial and ground-based photos, satellite images, GPS measurements, etc.). Students will engage in the construction and interpretation of geologic maps. Expect to spend lab time and some lecture time outdoors!

Course Goals
Students will:

- Develop mapping skills using a tape and compass

- Learn how to use survey equipment for precise location of features
- Learn how to collect rock orientation information using a Brunton compass
- Become proficient in measuring and mapping features in field settings using a GPS receiver
- Become proficient in transferring field data to a GIS environment
- Develop skills in creating and interpreting maps of geologic data
- Learn how to collect spatial information from remotely sensed data
- Develop spatial database management skills
- Become proficient with accessing and processing online spatial and geologic data

Tools for the course Students must have the following tools to complete the lab and field exercises:

- Pencils, preferably mechanical, with an eraser
- Field note book —see the textbook requirement at the top of the syllabus.
- Map case or clipboard
- Ruler or tape measure (metric)
- Sturdy shoes for field work (wear shoes you are willing to get wet—we will be hiking along and in some creeks!)
- GPS unit (check out from instructor as needed)
- Compass (check out from Lisa in the EAS main office)
  - Alternatively, you can purchase one for yourself. The minimum features for a compass include an inclinometer, an adjustment for magnetic declination, and sighting mirror. For $40-$70, you can buy a compass which is sufficiently accurate for most reconnaissance mapping, light weight, very easy to use. Here's a place to look for one... http://www.thecompassstore.com/ranger1.html. The classic industry standard is a Brunton pocket transit. It costs a lot more, but when used with a stable platform, it's a superior instrument. See http://www.opticsplanet.com/reviews/reviews-brunton-compasses.html for reviews of the various compasses. The compass store sells these pocket transits, one of which looks relatively affordable—the Harbin Compass DQL-8 here: http://www.thecompassstore.com/pockettransit.html.

Grading

Grades will be based on **exercises** (80%), and a **final exam** (20%). The exercises will involve collecting data in the field, creating maps, analyzing data, answering questions, etc., to be handed in when due (listed in each exercise).

Exercises will be graded based on a rubric which will detail necessary features that the student must complete and provide a scale for the quality of the student's effort. A rubric is a standard and a mirror which provides feedback to the student. Some of the exercises in the class will be repeated, so that the student learns from the rubric and is able to improve and develop skill and mastery of the technique. Lab write-ups will be due on Monday at the start of class following a lab exercise (labs occur on Wednesday). All exercises must be handed in by the due date.

Late work will be marked down exponentially, with a decay rate of -0.25 per day, up to a limit of 5 days, at which point your grade ceases to decay, but the damage is done, so to speak. The equation is: $G(t) = G_0 e^{\lambda t}$, where $G(t)$ is your grade after it has decayed over time, G_0 is your grade if you submit your work on time, λ is the decay rate, e is Napier's constant (≈2.71828), and t is time in days. For example the table below shows the value of a report up to five days past due:

Days Late	Value of report
0	100%
1.0	78%
2.0	61%
3.0	47%
4.0	37%
5.0	29%

Note that labs are worth A LOT, so even if you are 5 days or more late, you will still get something for the lab, and this is often the difference between a passing or failing mark for the course. **Do the labs in the time allotted! You won't regret it!**

Field notes are vitally important—whether the subject matter is environmental consulting, or more traditional geologic mapping. Field observations and notes form the basis of interpretation. Once back in the office, there is no other resource for a write-up than your notes. Believe me, memory just won't last! In addition, good note taking habits will often lead to new insight into the features you are mapping. **Field notes** *must always have the following*: **the date and time; location; purpose of exercise; a note on weather conditions; and a list of co-workers**. The notes should then include **measurements, maps, observations, and sketches** as appropriate to the exercise. Prior to leaving a field location, make sure you look over your notes for any omissions—and certainly keep your hands on your field notebook. A lost field notebook can mean the loss of a field season of observations!

The final exam will draw from all of the exercises, and compel you to bring together the various components of the course. It will be open note and open book, and take place on a laptop. You will be expected to make maps, create cross sections, perform coordinate transformations, process field data, and the like.

Final grade assignments will be based on the weighted sum of the average of scores received on the exercises (80%), and final exam (20%).

Grade assignments will be *guided* by the standard University curve given below.

Percent	***Grade***		***Percent***	***Grade***		***Percent***	***Grade***		***Percent***	***Grade***
93-100	A		87-89.9	B+		77-79.9	C+		67-69.9	D+
90-92.9	A-		83-86.9	B		73-76.9	C		63-66.9	D
< 60	F		80-82.9	B-		70-72.9	C-		60-62.9	D-

Lecture Schedule (*this schedule is subject to change if more time is required*).

Week	**Monday 12:00-12:50 p.m.**	**Wednesday 12:00-2:50 p.m.**	**Friday 12:00-12:50 p.m.**
8/26 to 8/30	No Class	Course Overview; Lab 1: Intro to Spreadsheets	Datums, scale, distance and angles; coordinates
9/2 to 9/6	Intro to coordinates; Math in Excel	Lab 2 Stride and Compass Survey	Lab 2 Write-up
9/9 to 9/13	Coordinates from bearing-distance data	Lab 3 Repeat Stride and Compass Plus Baseline Survey	Lab 3 Write-up
9/16 to 9/20	Total Station Surveying	Lab 4 Total Station Surveying	Lab 4 Write-up Due
9/23 to 9/27	Geomorphic mapping	Lab 5 Geomorphic Mapping	Lab 5 Write-up
9/30 to 10/4	Introduction to GPS	Lab 6 GPS Mapping	Lab 6 Write-up
10/7 to 10/11	Geologic Mapping	Lab 7 Geologic Mapping	Lab 7 Geologic Mapping
10/14 to 10/18	Lab 7 Geodatabases	**Fall Break**	**Fall Break**
10/21 to 10/25	Tablet Mapping: data integration	Lab 8 Tablet Mapping	Intro to Remote Geomorphic Mapping
10/28 to 11/1	**GSA** LiDAR Geomorphic Mapping	**GSA** Lab 9 LiDAR Geomorphic Mapping	Lab 9 Write-up Due
11/4 to 11/8	Remote Geologic Mapping	Lab 10 Remote Geologic Mapping	Lab 10 Write-up
11/11 to 11/15	Geologic Maps	Lab 11 Digital Geologic Maps	Lab 11 Write-up
11/18 to 11/22	Geologic Cross Section in a Spreadsheet	Lab 12 Geologic Cross Section in a Spreadsheet	Lab 12 Write-up Due
11/25 to 11/29	**NO CLASS**	**NO CLASS**	**NO CLASS**
12/2 to 12/6	Lab 13 Geology and Topography in GIS	Work on Lab 13	Work on Lab 13
12/9 to 12/13	Work on Lab 13	Lab 13 Write-up DUE	Review for Final!
12/16	**FINAL EXAM, Monday, Dec. 16, 11:00 am to 1:30 pm**		

College Calendar Fall 2013

August 25-27	**Sunday-Tuesday**	**New Student Arrival & Orientation**
August 28	Wednesday	Classes Begin
October 15	Tuesday	College Closes After Last Class
October 21	Monday	Classes Resume
November 22	Friday	College Closes After Last Class
December 2	Monday	Classes Resume
December 8	Sunday	December Recognition
December 16-20	Monday-Friday	Finals

Final Exam Week Class Schedule **December 16 - 20, 2013**

Date and Time	Monday Dec 16	Tuesday Dec 17	Wednesday Dec 18	Thursday Dec 19	Friday Dec 20
8:00am-10:30am	10 MWF	10 Tu Th	**9 MWF**	8:30 Tu Th	8 MWF
11:00am-1:30pm	12 MWF	2:30 Tu Th	11 MWF	1 Tu Th	2 MWF
2:00pm-4:30pm	1 MWF	11:30 Tu Th	4 MW	4 Tu Th	3 MWF

Emergency Evacuation/Shelter-in-Place Procedures:

In the event of an emergency evacuation (i.e. fire or other emergency), classes meeting in Science I are directed to reassemble at Chase Gymnasium so that all persons can be accounted for. Complete details of the College's emergency evacuation, shelter-in-place, and other emergency procedures can be found at http://www.oneonta.edu/security .

ADA (Americans With Disabilities Act) Statement

All individuals who are diagnosed with a disability are protected under the Americans with Disabilities Act, and Section 504 of the Rehabilitation Act of 1973. As such, you may be entitled to certain accommodations within this class. If you are diagnosed with a disability, please make an appointment to meet with Student Disability Services (SDS), 209 Alumni Hall, ext. 2137. All students with the necessary supporting documentation will be provided appropriate accommodations as determined by the SDS Office. It is your responsibility to contact SDS and provide the teacher with your accommodation plan before a test.

Policy on Academic Dishonesty

Academic dishonesty results in a loss of trust and open-ness which is the heart and soul of student-mentor relations. Plagiarism and cheating will not be tolerated in this course.

Please see the Code of Student Conduct for definitions and repercussions of Academic Dishonesty (http://www.oneonta.edu/development/judicial/code.pdf).

Course Expectations and Guidelines

In class responsibilities

Students will:

- Attend all classes and arrive punctually.
- If unavoidably late for a class, enter quietly and unobtrusively, and behave in other required ways to minimize distraction.
- Remain alert and attentive during lectures, discussions, and other class/lab activities.
- Avoid unnecessary conversation during lectures, discussions, and other class/lab activities.
- Contribute to class experiences by asking relevant questions, offering relevant examples or views, adequately answering questions posed by others, engaging in critical and independent thought, and challenging both the instructor and the curriculum materials assigned for the course.
- Demonstrate courtesy and respect in dealing with instructors and classmates.
- Recognize and seek to understand diverse points-of-view.

Out-of-class responsibilities

Students will:

- Place academic obligations at the top of the list of college-related priorities.
- Plan to spend 2 to 3 hours out-of-class time in academic study for every one hour of class attendance.
- Thoroughly plan and prepare for classes.
- Notify the instructor in advance, if possible, or in a timely fashion, if unable to attend a class or lab, take a scheduled exam or quiz, submit a scheduled assignment, or remain in the classroom for the entire class meeting because of unavoidable circumstances."