Field Methods in the Earth Sciences  
**GEOL 311**  
Fall 2017

Wednesday 5-5:50 p.m.  
C. M. Bailey  
x12445  
cmbail@wm.edu

Friday 1-5 p.m.

### Office- McStreet Hall 215

#### Purpose

Geology differs from many branches of science in that field research is important. Although techniques for studying the Earth have become more sophisticated and laboratory research is critical to the success of most projects, the field provides our primary data. At the end of this course you will be competent at doing fieldwork in a variety of settings. You will improve your powers of observation, become familiar with making geologic maps and geologic cross sections, logging borings, measuring stratigraphic sections, and conducting a geophysical survey. This course will focus on both traditional geologic fieldwork, as well as applied geological skills that are used in geotechnical fields. At the end of the semester we'll deliver a set of talks on the fruits of our labors, some of our field projects may yield new discoveries. The skills and the savvy that you acquire in this course will be useful in more ways than you know.

### The Plan

#### Week 1  
**Introduction & Purpose**

- Wed, Fri., Aug 30 & Sept 1  
Earth materials, GPS, and the Brunton compass  
_A campus excursion-_ field notes due

#### Week 2  
**Surveying, topographic maps, and soils**

- Wed, Fri., Sept 6 & 8  
College Woods 1- surveying & soils- field notes due

#### Week 3  
**Rocks, sediments, & structures**

- Wed, Fri., Sept 13 & 15  
The Real Rock Garden write-up due- Wed., Sept 13  
Fall Zone trip 1

#### Week 4  
**Geology of the Atlantic Coastal Plain**

- Wed, Fri., Sept 20 & 22  
College Woods topographic map due- Wed., Sept 20  
The 500 Acre Tract trip 1- field notes due

#### Week 5  
**1st month review, NO CLASS on Friday**

- Wed, Fri., Sept 27 & 29  
Departmental Field Trip to canoe the James River (optional)

#### Week 6  
**NO CLASS on Wed., Oct. 4- Chuck @ Geological Soc. of Washington**

- Wed, Fri., Oct 4 & 6  
Fall Zone trip 2 - field notes due

#### Week 7  
**Fall Zone Review**

- Wed, Fri., Oct 11 & 13  
NO CLASS on Friday- Beginning of Fall Break / Virginia Geological Field Conference (optional)

#### Week 8  
**College Woods mapping strategy**

- Wed, Fri., Oct. 18 & 20  
College Woods 2- boring & mapping

#### Week 9  
**Lake coring and geomorphology**

- Wed, Fri., Oct. 25 & 27  
Blue Ridge prequel due- Fri., Oct 27  
_Sat./Sun., Oct. 28/29- Maple Flats trip- lake coring & surficial mapping

#### Week 10  
**Tracking sea level through time**

- Wed, Fri., Nov 1 & 3  
College Woods project due- Wed., Nov. 1  
The 500 Acre Tract trip 2
**Week 11**  
Wed, Fri., Nov. 8 & 10  
Funkiness in the Fall Zone  
*Maple Flats map & sections due- Wed., Nov. 8*  
*Fall Zone trip 3*

**Week 12**  
Wed, Fri., Nov. 15 & 17  
Magnetic surveying- an introduction  
*500 Acre Tract project due- Fri., Nov. 17*  
*Sat/Sun, Nov. 18/19- Ash-Lawn/HIGHLAND- a geophysical study*

**Week 13**  
Wed, Fri., Nov. 22 & 24  
No Class- Thanksgiving Break

**Week 14**  
Wed, Fri., Nov. 30 & Dec. 1  
Geophysical data reduction  
*Fall Zone project due- Wed., Nov. 30*

**Week 15**  
Wed, Fri., Dec. 6 & 8  
Work with your partners on the research talk  
*Ash Lawn project due- Wed., Dec. 6*

**Fri., Dec. 8, TALKS + PARTY = Learning² + FUN**

**Grading**

<table>
<thead>
<tr>
<th>Assignment</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>Field Notes &amp; Maps</td>
<td>20%</td>
</tr>
<tr>
<td>Attitude/participation</td>
<td>5%</td>
</tr>
<tr>
<td>Rock Garden write-up</td>
<td>5%</td>
</tr>
<tr>
<td>Reading quizzes (3)</td>
<td>5%</td>
</tr>
<tr>
<td>500 Acre Tract project</td>
<td>15%</td>
</tr>
<tr>
<td>Fall Zone project</td>
<td>15%</td>
</tr>
<tr>
<td>College Woods project</td>
<td>15%</td>
</tr>
<tr>
<td>Maple Flats project*</td>
<td>15%</td>
</tr>
<tr>
<td>Highland project*</td>
<td>15%</td>
</tr>
<tr>
<td>Research talk</td>
<td>5%</td>
</tr>
</tbody>
</table>

*you’ll complete either the Maple Flat or the Highland project

**Readings**

There is no textbook for this course; however there will be a number of reading assignments. Reading assignments will be posted to Blackboard. Assignments should be read for comprehension and before the trips in which the material will be discussed.

**Required Supplies**

- field book
- mechanical pencils
- belt
- ruler
- colored pencils (12 pk)
- field pack
- protractor
- small pencil sharpener
- sturdy walking shoes
- 10x hand lens
- raingear
- field safety kit
- rock hammer

**Other Very Helpful Equipment**

- raingear
- field safety kit

**Our Class Community**: I welcome the broad range of backgrounds that W&M students bring to campus. It’s our individual and collective responsibility to create a respectful, cooperative, and inclusive classroom/field environment for everybody, regardless of race, ethnicity, nationality, culture, religion, political beliefs, gender, gender identity / expression, sexual orientation, age, disability, or marital, parental or veteran status.