

Appalachian Geology Seminar - Geology 350

Instructor - Dr. Arlo Weil 195 Park Science Building

Phone: (610) 526-5113; Email: aweil@brynmawr.edu

Official office Hours – Flexible and by appointment

Class meeting time –1:10 pm- 2:30 pm Tuesday and Thursday **Class location** – Park 373

DESCRIPTION: In this seminar, we will explore the geologic record of the Appalachian Mountains, which includes:

- Exploring the evolution of the Phanerozoic margin of eastern Laurentia prior to initiation of Appalachian orogeny.
- Exploring the temporal and spatial variability of the Appalachian orogeny in North America as well as the other major continental plates involved.
- Delving into the evidence and ramifications for the opening and closing of several major oceans, and the implications of these tectonic events on other Earth surface systems.
- Discussing the effects of continental collision on North America, Europe and Africa during and after the formation of the Pangea supercontinent.
- Exploring the collapse of the Appalachians and the transition to a rift-and-drift margin.
- Exploring the question of what has the Cenozoic/recent past done to the Appalachians?

All of these topics will be approached from a multi-disciplinary perspective – using geobiology, geochemistry, geophysics, marine geology, tectonics, etc.

COURSE STRUCTURE: The content of this course revolves around readings from the primary literature. For each topic, we will read several articles or book sections. Most topics will have discussion leaders who will be responsible for a more thorough reading of the assigned text. Each class meeting will consist of a discussion of the designated topic.

PRACTICAL SKILLS: You will work to develop, improve, and eventually master the following—

- Read and interpret data from the primary literature;
- Write concise, accurate, and thoughtful critical summaries of scientific articles;
- Lead discussion groups in a topic in which you have expertise;
- Participate effectively in discussions.

ASSESSMENT: Your grade will be determined as follows—

Informal reading summaries (4 total)	20%
Formal reading summaries (4 total)	20%
Participation	15%
Discussion leading and preparation	20%
Field Trip report	10%
Paleogeography Technique project	15%

Total – 100%

ASSIGNMENTS:

Informal Reading Summaries

As you work through the assigned readings for each topic, you will take notes to track key arguments and findings across articles, deepen your understanding of the material, and practice identifying the most important content in a scholarly paper. These notes constitute your informal reading summaries. For each assigned reading, your notes should address the following:

- The title and author of the article
- The main point or conclusion — particularly how it relates to our broader narrative on the geology of the Appalachian Mountains
- The main data and/or arguments presented
- Your assessment of whether and how the data and arguments support the conclusion
- Your overall thoughts on the paper
- Questions you have about the data, arguments, or conclusions

You must submit at least four summaries over the course of the term. Summaries are due on the last day a given topic is discussed in class and cannot be submitted after that date. You may submit them typed or handwritten - whatever format you naturally take notes in. Complete sentences are not required; these are, at their core, your notes. You should, however, organize them in a way that allows you to quickly locate information during class discussion.

Formal Reading Summaries

Building on your informal notes, formal reading summaries ask you to synthesize and communicate your understanding of the assigned readings for a given topic (e.g., the papers on the Taconic Orogeny) in polished essay form. Think of this as a meta-analysis exercise. That is, rather than simply noting what each article says, you will organize your observations across the readings into a coherent, well-structured short essay.

Each formal summary will include short essays on EACH of the assigned readings for a given topic. Each papers essay should be 500–800 words and address the same core elements as your informal summaries — main conclusions, key data and arguments, and your assessment of how well the evidence supports those conclusions, but here those elements should be woven together in a logical essay framework rather than presented as notes. Accuracy, clarity, completeness, style, and grammar all matter. The essays should finish with a paragraph the frames the through going narrative you gleaned from the core readings on the given topic of focus. Any question on the readings/topic should be listed at the end in bullet format.

You must submit at least four formal summaries over the course of the semester, adhering to the following deadlines:

- 1st summary — due by Week 4
- 2nd summary — due by Week 8
- 3rd summary — due by Week 12
- 4th summary — due by the last week of classes

All formal summary submissions must be typed with double space.

Participation —Because this course centers on in-class discussions, the participation grade is important and real. You are expected to come to class (on time), demonstrate that you have done the assigned

reading for the week, and contribute meaningfully to the discussion by asking questions, venturing ideas, or otherwise interacting with your peers.

Lead discussion —For several of our class meetings, a group of students will be designated as the discussion leader. These students will be responsible for a thorough reading of *all* assigned text. The leader(s) will present a brief summary of the topic. Following the summary, the leader(s) will manage the discussion of the material, prompting further discussion and engaging the rest of the class on the topic. All students will participate in this exercise.

Paleogeographic technique research project: The topic of this research project will be focused on a technique/tool that geologist uses to constrain past paleogeographic conditions – e.g., paleomagnetism, detrital zircon provenance analysis, radiogenic isotope analysis, crustal age determination, fossil assemblage comparison, etc. The details on the nature of this project will be given in a separate handout.

Field Trip — A field trip is tentatively planned to look at Taconic and Acadian deformation in north-central PA, northern New Jersey, and the Hudson Valley of NY. There will be a field-trip write-up that accompanies the trip, which will be due two weeks after we return. The field-trip date will be determined within the first two weeks of class.

RULES OF CONDUCT:

Because the learning in this course takes place during discussions with one another, it is very important that you be respectful of each other. The attitudes and behavior of every member of this class will affect the environment and dynamics of the classroom. Be respectful and supportive of your classmates. There are no dumb ideas – there are *wrong* ideas, but that is not the same thing. At some point, each person in the class will be the —expert, and each will struggle with the material.

It is your responsibility to be fully —present in the classroom. Turn off cell phones; do not text during class. Come prepared and pay attention in class. If you use a laptop in class, it should only be used for class-related work (e.g., taking notes electronically is fine; surfing the web or downloading music during class is not).

The line between productive collaboration and plagiarism (copying) is often a difficult one to identify. While I expect you to work together to understand and evaluate the course material, the work handed in with your name on it must be your own. Do not copy another student's notes or formal work. Never copy and paste text from an article or from a website into work that you are creating, even if you cite it.

AI: Students are NOT allowed to use advanced automated tools (artificial intelligence or machine learning tools such as ChatGPT or Dall-E 2) on assignments in this course – **especially in producing the informal and formal summaries of the assigned readings.**

Disabilities: Students with disabilities that may impact their access to the class (including class materials, seminars, and presentations) should approach us to discuss accommodations. Students should consult with Access Services so they are aware of access accommodations available through the college. Contact information for Access Services: Deb Alder, 610-526-7351 or dalder@brynmawr.edu

Appalachian Geology –350 Tentative Calendar

Dates	Topic
Week 1 Sept 1 st – 4 th	• Paleogeographic techniques • Supercontinents
Week 2 Sept 7 th – 11 th	• Grenville Orogeny • Rodinia
Week 3 Sept 14 th – 18 th	• Formation of the Iapetus Ocean
Week 4 Sept 21 st – 25 th	• Taconic orogeny
Week 5 Sept 28 th – Oct 2 nd	• Caledonian orogeny
Week 6 Oct 5 th – 9 th	• Avalonia and the Peri-Gondwana terranes
Week 7 Oct 12 th – 16 th	<i>Fall Break</i>
Week 8 Oct 19 th – 23 rd	• Acadian orogeny
Week 9 Oct 26 th – 30 th	• Ouachita/Marathon Orogeny
Week 10 Nov 2 nd – 6 th	• Alleghanian Orogeny
Week 11 Nov 9 th – Nov 13 th	• Variscan Orogeny
Week 12 Nov 16 th – Nov 20 th	• Pangea Formation
Week 13 Nov 23 rd – 27 th	• Breakup of Pangea
Week 14 Dec 30 th – Dec 4 th	• Formation of the Atlantic and Gulf of Mexico
Week 15 Dec 7 th – 10 th	• Modern Landscape Evolution of the Appalachians
Week 16 Dec 14 th – 18 th	<i>Exam Week</i>