**Field Paleontology and Geology of Wyoming**

**ENVS 387**

**Faculty Information**Dr. Brooke Haiar

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**Meeting Times**June 30–July 20

**Course Materials**Handouts available on Moodle

**Course Description**
*Field Paleontology and Geology of Wyoming (ENVS 387)* 3 hours.  Insert generic DS course description here.

**Course Overview**

This course provides LC students with the opportunity to conduct geological and paleontological field research. Students will do coursework in preparation for 2-3 weeks in the field in Wyoming. Students will camp in Greybull, Wyoming and learn how to interact with peers and mentors in a field camp setting. Participants in the dig include students, volunteers from the community, and researchers from LC and Virginia Museum of Natural History. Students will excavate a Jurassic-aged (145 million years ago) sauropod dinosaur from the Two Sisters Quarry near Shell, Wyoming. This course will also include a field trip to Yellowstone National Park to explore the unique ecosystem that is contains, as well as a museum trip to the Wyoming Dinosaur Center in Thermopolis. This course meets several of our major learning outcomes, including: SLO 2.1 – Acquire knowledge on a specialized environmental topic or issue; 2.2a – Acquire field and laboratory skills;  4.1 – Communicate effectively orally and in writing; and 5.1 – Apply knowledge of environmental systems to identify, analyze, and propose initiatives through a research project, internship, or study abroad experience. Assessment of these learning outcomes are outlined on the attached syllabus, and include daily journal logs, peer-lead conversations on source material, and group presentation to the community upon return.

**Core Goals**INQUIRE-frame questions that address issues and uncertainties across a range of disciplines

The first step in the scientific method is to ask questions about a situation or a problem. Sometimes these questions come from observation and sometimes from literature research. This is arguably the most important step. Knowing what you don’t know is a very difficult thing to achieve.

SLO 1.1 – Acquire conceptual knowledge in the core environmental courses.

EXPLORE-investigate issues in depth and detail

 In science, our exploration usually starts in the library. In order to fully understand your question, you need to understand what has been done before. There is no sense in reinventing the wheel. The background research you do will enable you to better frame your question and design the next step.

SLO 2.1 – Acquire knowledge on a specialized environmental topic or issue.

CONCLUDE-develop informed responses to issues

 The word “conclude” contains a lot of different steps in science. The scientific method word for this step is “hypothesize”. In science you rarely come to a hard conclusion, and never at this early stage of a question. You come up with a hypothesis that explains the data, or solves the problem you are addressing. Then you come up with a way to test that hypothesis. In this step you have to design a research project that will allow you to collect data that addresses your hypothesis. These data can be a result of new research, such as going out and collecting samples, or from gathering previously conducted research and analyzing them in a new way.

SLO 3.1 – Understand the factors (sub-disciplines) contributing to the environment and the major principles that apply to each sub-discipline.

SLO 3.2a – Recognize human impacts on environmental systems.

PERSUADE: convince others of the validity and value of conclusions

At this stage, your data do not agree or disagree with your hypothesis. You have to provide an interpretation of your data using scientific principles. This would be the results section of a paper. Most of the time your hypothesis will be disproven. That is a good thing! It means that you now know of all the possible answers to your question, that is not one of them. You very rarely prove your hypothesis correct. If all of the data you collect do not disagree with your hypothesis, that does not mean you are right. It means that your hypothesis seems to be one answer to the question, though there may be others. It also allows other scientists to come behind you and test your hypothesis as well.

SLO 4.1 – Communicate effectively orally and in writing.

ENGAGE: use knowledge and abilities for the good of self and society

 This part of the scientific method is how we, as scientists, get paid. Basically, why does it matter how many toes a frog has, or what happens to College Lake when it rains? In this class, we will learn about how the Earth formed and the geologic resources and hazards that we live with every day. Knowledge of these basic principles are important for you to understand. Not just for the specific scientific fields you are entering, but everyday life. Hazards help you answer questions like, “Where should I build my house.” Geologic resources help you address problems from domestic financial issues to global climate change. Understanding these issues will also be important for you as members of a society where these principles are questioned every day.

SLO 5.1 – Apply knowledge of environmental systems to identify, analyze, and propose initiatives through a research project, internship, or study abroad experience.

SLO 5.2 – Obtain employment or entrance into graduate school.

**Course Objectives/Learning Outcomes**

Students will understand . . .

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| --- | --- |
|   | Assessment Tool |
| **Concepts** |   |
| The nature of scientific inquiry | Daily field work, journal |
| Putting data into context | Daily field work, journal |
| **Skills** |   |
| Primary literature review  | Daily field work, class discussions, journal |
| Field and laboratory skills | Daily field work, journal, field participation |
| **Processes** |   |
| Critical thinking | Daily field work, journal, field participation |
| Real world applications | Daily field work, journal, field participation |

**General Requirements**The requirements for successful completion of ENVS 387 include several sets of criteria.  Your final grade will be based on each of these:
(a) quality of discussion with the class on primary literature about your topic and annotated bibliography
(b) sufficient time spent in the lab and/or field
(c) completion of a journal containing daily reports

(d) presentation of work accomplished before the fall semester

**Specific Requirements**

 *Daily Journal*: Important parts of the class are the daily notes and journal.  Students must document their work daily in a field notebook. This will be due at the end of the field season, or upon request by the faculty mentor.

*Literature Discussions*: We will have daily discussions on the methods of field work, the literature assigned, as well as the development of scientific ideas. These discussions will be graded based on participation and required background knowledge.

*Field Participation*: The ability to conduct field work in a professional manor is an important component of this class. Students will be graded on how they comport themselves in a field research situation.

*Presentation*: The class as a whole is required to present the information and skills learned during the course. This presentation will happen before the beginning of the fall 2018 semester.

**Grading Structure**

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| --- | --- | --- | --- | --- | --- | --- | --- |
|   |   |   | Number Grade | Letter Grade |   | Number Grade | Letter Grade |
| Daily Journal | 40% |   | 97-100 | A+ |   | 77-79 | C+ |
| Lit review and discussions | 25% |   | 93-96 | A |   | 73-76 | C |
| Field Participation | 25% |   | 90-92 | A- |   | 70-72 | C- |
| Presentation | 10% |  | 87-89 | B+ |   | 67-69 | D+ |
|   | 100%  |   | 83-86 | B |   | 63-66 | D |
|   |   |   | 80-82 | B- |   | 60-62 | D- |
|   |   |   |   |   |   | <60 | F |