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Office: KLA 73  
Office Hours: Mondays 3 - 4, and by appointment

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“Lectures” Mondays, Wednesdays, and Fridays, 4 PM - 5 PM, in Fenton 110

“Discussion Sections” Wednesdays, 8 AM - 11 AM, in Huestis 130

The Idea Behind This Course

We live in a world teeming with life, unique in the known universe. What we can see around us in our personal experiences is just a small sampling of the diversity of the biological world. This course is an attempt to help us see more of the biological world. As a guiding principle, we will examine biological diversity in three dimensions: space, scale, and time. A great deal of biological diversity exists nearby, but much and more is distributed around the globe. Some of the biological world is too small to be seen, but technological innovations have begun to bring it into view. And nearly all that has existed is now gone. We will look at all of these components of the biological world, through books, popular media, and primary research articles. We will also explore these ideas as practicing scientists do: through collaborative and individualized ideation, writing, and presentation.

By the end of the course, students will be able to:

- Evaluate the effectiveness of competing approaches to describing biological diversity
- Classify components of the biological world in terms of their relationships in space, time, and taxonomy
- Assess the strengths and weaknesses of alternate approaches to conserving biological diversity
- Assess the strengths and weaknesses of basic research programs focused on biodiversity
- Propose, explain, and defend a new research path, relevant to current topics in biodiversity research
Classroom Conduct

Our classroom must be a place where people are free to present their ideas, express their opinions, and question assumptions. We ask that we all do our best to be intellectually honest, while also being tolerant of personal differences. We welcome the intellectual controversy that will stem from your ideas and the ideas in this course. That controversy is essential to real learning.

At the same time, we ask that we all respect the rights of others to hold different opinions, even as we challenge the ideas supporting those opinions. We will debate these ideas passionately, but never acrimoniously. Strive to make it clear to your classmates that you respect them and value their ideas, even when you disagree.

If you have a documented disability and anticipate needing accommodation in this course, please make arrangements to meet with us soon. Please request that the Counselor for Students with Disabilities sends a letter verifying your disability.

Crises happen. If you are having problems that are interfering with your ability to do the work for this class, please let us know promptly. We are always willing to make special arrangements when the need is real and when you have done your best to address the situation in a timely manner. The University of Oregon Crisis Center, a student funded organization, provides students with confidential telephone crisis intervention 24 hours a day, 7 days a week. The hotline number is 346-4488. Students often believe that their issues are not severe enough for them to call, but at the Crisis Center, no problem is too small.

Policy on Academic Dishonesty

Academic dishonesty, which includes cheating and plagiarism, is a serious offense. The university has a good resource on proper practices for quotation and attribution (http://library.uoregon.edu/guides/plagiarism/students/index.html). Always err on the side of excessive attribution, and bring any concerns over proper conduct to me. The Administration and we will treat any academic dishonesty according to the guidelines in the Student Conduct Code (http://conduct.uoregon.edu). This does not mean that you should develop your ideas in isolation from other students. It means that when you write something or choose a term paper topic, it must be your own work.
Student Responsibilities 1: Readings, Micro-Blogging, In-Class Assignments

This is an upper-level, project-based course. This course requires a substantial amount of background reading for each class. Each day of class we will meet to discuss the assigned readings, and use them as a starting point for solving scientific problems. Much of our class time will be dedicated to discussing the implications of the assigned literature. The success of these discussions will depend on your engagement. As such, it is vital that you keep up with the readings. Be sure to read the material thoroughly prior to each class. Don’t be discouraged if you don’t understand everything prior to class. The point of our discussions is to use our combined intellectual powers to figure out exactly what the author meant, and to determine the readings’ implications for the larger issues that we are exploring.

To help us discuss these readings, you will use blog entries to record your thoughts, impressions, and ideas. Each blog post should reflect your effort at critically engaging with the material, your classmates’ comments, and other issues in the world around you. These do not need to be polished works, but you should take care to write them using proper English and clear language. The purpose of these blog posts is to give you more opportunities to develop your ideas and discussion as the course progresses, and to allow us to work with you iteratively on your writing during the course.

You must complete at least one blog post per week, submitted electronically to Canvas. (For our purposes, the deadline is 11 PM on Friday night.) You are very welcome to complete and submit more, if you like. Although there is no minimum or maximum length requirement, aim for about 250 words.

We will maintain a class-wide discussion on Canvas, where we (the instructors) will also complete this weekly blogging requirement. If we are particularly impressed or intrigued by your micro-blog submission, we will ask for your permission to publish it on our class blog, where it can be a topic for further discussion.

Most classes will also include work in groups to propose solutions to scientific problems related to different aspects of biological diversity. We will rely on iClickers to allow you to demonstrate your understanding and learning.

Student Responsibilities 2: Presentations on Assigned Readings
While we are all responsible for contributing to a productive discussion, each student will also be responsible for collaboratively presenting one reading assignment and leading the discussion. We will sign up for these presentations during the first discussion section, on the morning of Wednesday, September 30th.

The use of PowerPoint, Keynote, Google Docs, or something similar, is strongly encouraged. This is to allow you to focus our attention on key figures, tables, and passages.

Presentations on scientific articles should follow this format:

- **Introduction**
  - What was the purpose of the study?
  - What questions were the authors trying to answer?
  - Why is this interesting and important?
- **Methods**
  - Explain the methods of each experiment. Walk us through the tables and figures showing the results.
  - Mention any problems or possible areas for improvement in the experimental design or interpretation.
  - Raise questions about things you didn’t understand.
- **Evaluation**
  - What is the author’s overall claim? Do the experiments support this claim?
  - What are the lessons for science, health, and the environment?
  - Identify unresolved issues, and how they might be resolved.

Presentations on politics, policy, philosophy, or sociology should follow a format like:

- **Introduction**
  - What issue is the author addressing?
  - Why is it important?
  - Is there relevant historical or political context that we should know?
- **Thesis – State the main thesis**
- **The Argument**
  - Identify each major sub-argument (there are usually 2-4)
  - Define key concepts or terms.
  - Present the argument *in good faith.*
- **Implications – What are the major implications of the work?**
- **Evaluation**
● Are there flaws in the author’s argument?
● Are there major issues that the author ignored?
● Are there unfounded assumptions? Errors in logic?
● Could the author’s argument be extended further?

If your presentation includes more than one reading, identify connections between the readings. Practice your presentation in advance to be sure that it flows well, that you’re familiar with the material and your treatment of the material, and that the presentation isn’t too long. Uninterrupted, a presentation should take about 15 minutes. To meet this time limit, you will have to choose which material is important. An effective presentation highlights the most important parts of a reading to illuminate the argument and facilitate productive discussion. You do not need to become a world expert on your presentation materials, but you do need to ensure that you are in a strong position to lead the discussion.

You are welcome to meet with us to ask questions about your presentation, or to practice it in advance.

**Student Responsibilities 3: Research Proposal**

Each student will collaborate with up to four other students to produce a written research proposal, and to present this proposal to the class. Proposals may cover one (or both) of two broad components of biological diversity that we cover in this course. Those are (1) paleobiological diversity and (2) microbial diversity. In either case, your project must include the following:

● What is the motivation for exploring this component of biological diversity? What are you hoping to achieve?
● A description of what is known about the organisms and the environment you are investigating
● A description of the field setting for any field work you propose
● Descriptions of the tools and techniques needed to implement any field work you propose
● Descriptions of the tools and techniques needed to conduct any laboratory work for your proposal
● Descriptions of the types of data your project will generate, and qualitative and quantitative analyses you will perform to demonstrate your findings
● Figures and tables to communicate your ideas
● A realistic timeline for completing your proposed research
● An honest reflection on the most difficult or problematic components of your proposed approach, and how alternative approaches might obviate these problems
● A thorough and complete set of references in Council of Science Editors (CSE) Name-Year (N-Y) format. You must include at least 25 peer-reviewed publications.

Along the way to writing this paper, you will produce several intermediary documents:
● A list of at least ten potential topics for your project generated and submitted as a group, due by 4 PM, Monday, Nov. 9th
● An outline of your proposal, with all required sections detailed and assigned lead authors, and properly-formatted citations listed, generated and submitted as a group, due by 4 PM Friday, Nov. 13th
● A complete first draft of your proposal, with tables and figures, and lead authors’ contributions signed, due by 4 PM Monday, Nov. 23rd
● A final draft, due by 4 PM Friday, Dec. 4th

The paper should be formatted with the following sections:
● Abstract: a concise paragraph explaining the project, the work you intend to do, and what you expect to discover
● Introduction: describe what is known about your biological systems, as it pertains to your investigation of the diversity in that system
● Field research design (if needed): What are you planning to do? Where? How many personnel will you require? What tools will you need? How long will it take?
● Laboratory research design (if needed): What are you planning to do? How many personnel will you require? What facilities will you need? Will you need to culture or raise any organisms? What tools will you need? How long will it take?
● Backup plan/extension: What will you try first if your approach doesn’t work? Or, if it works perfectly the first try, how would you try to extend your work?
● Honest reflection: What might not work? What the weak points? What aren’t you sure about? Be forthright about what you know and what you don’t, and how your proposed research might fall short.
● References: CSE N-Y format. One online resource: http://bit.ly/1Q1V3Po

You will work together to deliver a presentation of your research proposal to the class. The presentation will be 20 minutes long, and allow 5 minutes at the end for questions from the audience. As with the presentations on reading assignments, we highly encourage you to use
some type of presentation software to organize your work. Presentations will be during the final two weeks of the course, which will allow you time to revise your paper based on feedback from the class.

Have fun with this, please! You don’t have to actually do this project - there is no review board that will fire you if your project isn’t funded. All you have to do is be creative and think your way into the future of scientific research. If you do this well, 5 years from now you are likely to read a scientific publication on this work. You may even be the one who writes it.

**Course Assessment of Student Learning**

Attendance, participation, and clicker participation (15 points/week) 150
Microblogging (due 11 PM Friday, weekly, 15 points/assignment) 150
Presentations on Assigned Readings (weeks 2-6, date assigned Sept. 30) 200
Research Proposal
   Potential Ideas (due 4 PM Monday Nov. 9) 25
   Outline (due 4 PM Friday Nov. 13) 25
   First Draft (due 4 PM Monday Nov. 23) 50
   Presentation (weeks 9 & 10, date assigned Sept. 30)
      Overall 120
      Personal Contribution 80
Final Draft (due 4 PM Friday, Dec. 4)
   Overall 120
   Personal Contribution 80

**Total** 1000

**Tips on How to Succeed in This Course**

- Read the material thoroughly before class and skim the materials again just before class
- Attend all of the class sessions, listen actively, and participate to the greatest extent possible using your most constructive behaviors
- Ask questions during presentations if there are terms or concepts you don’t understand
- Meet with students outside of class to review, discuss, and work
- Meet with instructors outside of class to address your ideas, questions, and concerns as early as possible
• Ask yourself how what you are learning matters. If you don’t have a good answer, come talk to us or your classmates

**Texts (available at the UO Duck Store)**


**Other Readings (available on Canvas)**


Siegwarth JD, Smith CN, Redman PD. 2011. An alternative sauropod physiology and cardiovascular system that eliminates high blood pressures. Lethaia 44:46–57.


...and further readings still TBD