Welcome to Geobiology! In this class, we will explore life on Earth with a focus on how biological and geological processes are entwined. We will study feedbacks and interaction styles, how life on Earth functions, evolution and ecology, and how several billion years of interactions have shaped both us and our planet. As an instructor, I will focus on helping you learn how to approach understanding life on Earth as a scientist who understands processes. My goal is for you to effectively apply your understanding of geobiology to a final project, consisting of a science-based game or portfolio representing what you accomplish in the quarter.

Accommodations and Professional Behavior

This class will be entirely online to protect our health and that of our communities. Online learning is challenging for all of us, and particularly for you as students who are taking a full load of classes with a less than ideal format. I recognize and appreciate that different people have different learning styles, some of which make it very difficult to learn online. I am willing to work with each of you to help you succeed. Please, please, please feel free to ask me for accommodations for your personal circumstances as needed. I will not ask for explanations beyond what I need to know to help you, and I will not ask for documentation. I trust you. In return, I request that each person abides by the UCD principles of community. In addition, I expect professional behavior from myself, Steven Mendonca (the TA), and each of you. Professional conduct includes contributing to the goals associated with each activity, treating others with respect at all times, and being considerate of how your actions affect others. There are two documents posted in Canvas that describe professional behavior. Most of this is for in-person behavior, and we can extend it to online behavior. Please think about how what you share online might affect others in the class, particularly in this time of heightened stress. We need to act professionally in our online environments as well as in person. And we can have fun while doing so.

A Learning Community with a Growth Mentality

It is really important that we build a learning community for class given that we are facing physical isolation and social distancing; social justice and political upheaval; and recent environmental disasters of various types. With the extra challenges we are facing, it is even more important than normal to do our best to maintain our mental wellness. UCD has a number of resources that can help:

- Mental Wellness Resources
- Racial Trauma Resources
- Campus Coronavirus Information
This is a time like no other in human history. We are unlucky to be facing so many challenges all at once, but we are lucky to be virtually together in class. By recognizing the challenges, discussing them openly as appropriate, and focusing on learning, we can build resilience and grow as individuals and as a community learning together. Let's make the best of the situation by being there for each other. Communities are more resilient than individuals, particularly diverse communities where each member shares their strengths and knowledge with the group. I'm looking forward to working with you this quarter.

**Overall Course Structure:** The course materials are designed to give you a basic understanding of biology in the context of Earth at a level that is appropriate for Geology Majors (and other majors are also welcome!). My overall learning goals for each of you are described in the Outcomes section of Canvas. They emphasize the importance of interactions, what life is, evolution, ecology, and biogeochemistry as 5 “units”. We will cover this material in about the first 7 weeks of the quarter. These units will be covered using pre-recorded videos, online reading, and in-class discussions and games, as well as homework questions. The last few weeks will be dedicated to diving more deeply into topics of specific interest and applying them in your final projects.

**Detailed Course Structure:** Scheduled class times will focus on interactive activities that will help deepen your understanding of the course Outcome materials. They will include answering questions about the materials, discussing ideas in small groups, playing games relevant to the learning goals, analyzing game play in terms of scientific concepts, and brainstorming ideas for new games and projects. My goal for this time is to provide a dynamic learning environment, which is so hard to find with online learning. Parts of it will be recorded, but much of the value will only be available during the class time. If you cannot make it to class, it is possible for you to learn the material from asynchronous resources, but it will be very important to keep in touch with me with respect to the final projects especially.

The course is structured around helping you master the course learning goals described in the Outcomes section of Canvas. Each Outcome will have a Module or Page in Canvas that includes links to videos, reading, game instructions, additional materials, and homework questions. The homework questions are designed to allow you to demonstrate your understanding of the Outcome content and will be graded as:

- Redo (not relevant to the question)
- Progressing (partially correct but key item(s) missing or wrong)
- Competent (demonstrates a good understanding)
- Proficient (explains how the concept is relevant to an example)

Comments will be provided about what is missing or wrong and what you have done well. You will have two opportunities to revise your homework to
demonstrate your understanding. These opportunities can be either written or oral, your choice.

To demonstrate your mastery of course Outcomes, you will apply your understanding of the concepts to the development of a science-based game for people to play or to a mini-research portfolio. These can be group projects, and each has assignments to help guide you to a strong outcome. In the past, the games have been really fun to develop and play. Project assignments will be graded as redo, progressing, or mastered for a particular Outcome, and you will have multiple opportunities to demonstrate mastery of any given Outcome.

**Grading:** Your grade will be based on your demonstrated understanding of the learning goals represented in 10 Outcomes. I will be using “mastery grading” for the first time this quarter, and I think it will both help keep your workload down and facilitate a deep learning process. Mastery grading focuses on the level of understanding an answer demonstrates rather than a partial credit system for how much is correct. For this class, once you demonstrate a certain level of understanding, you do not need to demonstrate it again and you know to concentrate your time on learning other concepts. Your grade will be based on the number Outcomes you demonstrate that you have a given level of understanding. Levels of demonstrated understanding will be marked as competent, proficient and mastered. If you demonstrate proficiency, you will also have demonstrated competency, and mastery also demonstrated proficiency and competency.

Each grade requires obtaining the following number of competent, proficient and mastered outcomes through the homework questions and the final projects.

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<th>Grade</th>
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In addition, passing requires that you demonstrate progress toward becoming a scientist. These criteria include:
1. At least 3 demonstrations of a growth mentality by revising work, asking scientific questions in class or office hours, or applying your knowledge.
2. At least 3 collaborative activities, including playing games together in class or working in a group.
3. Submission of a game or portfolio that includes clear communication of at least one scientific concept (overlaps with the Mastered requirement above).

One of the advantages of this grading approach is that you can evaluate where you are in your progress toward the grade you wish to earn. Each time you
demonstrate competency, proficiency or mastery, you have that credit in the “bank” toward your grade. In addition, if you demonstrate proficiency or mastery, you automatically demonstrate the lower levels of understanding. Thus, if you miss an assignment, you can demonstrate your mastery in the topic as applied to your final project. I recognize that this grading system is probably new to you – and it is to me. I am hoping that it will help you demonstrate what you have learned with less work overall.

**e-mail List:** I use the UCDavis e-mail class lists and Announcements section of Canvas for official class communication as well as help with homework, clarifications on lecture material, and answers to student questions that I think will be of general interest. Please read these messages.

**Collaboration:** I encourage you to talk about the class lectures and homework with your fellow students because that increases understanding. In addition, there is the option for group work for game projects. With collaboration, it is important to keep the focus on learning. Each student must do and turn in their own work unless it is a group assignment. Doing this work will help you learn the material. If you have any doubts about whether a particular collaboration is allowed, ask yourself, “Does what we’re doing improve the understanding of all of us?” If the answer is yes, it’s probably allowed. Or if the answer to “Would someone benefit more if they did the work by themselves?” is yes, then it probably isn’t a good collaboration. Please ask me if you are in doubt!