

## Sediments and Strata Geology 109, S 2020

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Lectures: MWF 12:10-1:00 pm, online  
Office Hours: M 1-2, Th 10-11, F 3-4

### Resources:

Canvas Course Site

YouTube: [sumnerd](#)

[LibreText class notes](#)

Sedimentology and Stratigraphy, II Edition, by Gary Nichols

This class will be entirely online to protect our health and that of our communities. This will be challenging for all of us, and particularly for you as students who are taking a full load of classes with new formats. I recognize and appreciate that different people have different learning styles. And under our current circumstances, individuals will be experiencing unusual challenges and demands on their time. I am willing to work with 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, the TAs, and each of you. Professional conduct includes contributing to the goals associated with the 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 behaviors. 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 all professional environments. And we can have fun doing so.

**My goal for Sediments and Strata** is to help you develop the tools that will allow you to observe the important characteristics of sedimentary rocks, understand the processes that produced them, interpret their depositional environments, and recognize the constraints that they can place on diverse fields in geology such as tectonics, environmental geology, economic resources, evolution, climate change, etc.

**Overall Course Structure:** Lectures are designed to cover important concepts in sedimentology and stratigraphy in the first weeks followed by approximately one lecture per depositional environment for much of the rest of the course. We will end with large picture stratigraphic methods for reconstructing Earth history and other applications. Lectures will emphasize more general concepts and examples, whereas the readings and homework will provide the working details. Reading the texts is critical to developing a solid understanding of sedimentology and stratigraphy.

**Detailed Structure:** This is the first time I'm teaching an entirely online class, but I do have experience with effectively using online materials. Thus, I have a course structure that I think will provide you with a diverse suite of ways to learn the material. Here are the learning opportunities that I'll provide and an example workflow for you to tailor to your own learning style:

### Materials:

1. **5 minute YouTube videos:** These videos will take the place of lectures. I am breaking them up into short segments because learning research shows that most people only pay attention for a few minutes.
2. **Canvas quiz on each video:** There will be a quiz for each video to help you make sure you got the basic ideas I was trying to communicate. You will be able to take these quizzes as many times as you need to in order to get 100%. My goal is for you to use them as a learning tool. You will receive course credit for completing them (30 points total).

3. **Sedimentology and Stratigraphy** by Gary Nichols: This is a good, easily read book. I require it because it is very good for those who learn best by reading. It contains details on describing sedimentary rocks and sedimentary structures that are not yet in the LibreText class notes. Thus, it is important, particularly chapters 2-4.
4. **LibreText class notes**: I am building a free online textbook, and there are student taking an extra unit of credit with me this quarter who will be working on taking it from notes to a real book. If you want to help, you can obtain extra credit for class (or 109L) or be paid (I'll need to confirm this). This site contains my prose notes for lectures as well as other resources, such as photos, examples of depositional environments, etc.
5. **Class discussions and collaborations**: During the scheduled class times, I will be online, posing some interesting questions and problems related to the topical material for that discussion. I will assume that you have previously watched the videos associated with that discussion, and we will use the time to engage with the ideas. I will plan the questions to help you step through the logic of the problems, learning the concepts at a deeper level (I hope). You will have the chance to ask questions via chat as well as verbally, so we can engage in a dialog about the material.
6. **Homework**: There will be a homework assignment for each discussion, due a week later. Since there will be so many assignments, they will each be short. The questions will be directly associated with the material in the discussion. They are designed to help you apply what you are learning on your own to see how well you understand the materials. (60 points total)
7. **Office hours**: I will hold online office hours Mondays at 1-2 pm, Thursdays at 10-11 am, and Fridays at 3-4 pm (given that none of us are going out on Friday evenings...but if 103 requires many of you to be occupied at that time, I can change this one). They will be either on zoom or Canvas with me on video and you on video or audio only. (I still need to compare platforms.)
8. **Final project**: Rather than give a final, I will assign each student a project near the end of the term, which can also be viewed as a take home final. It will consist of some real sedimentological and stratigraphic data that you will interpret following guidelines I'll provide. The project will be designed to allow you to apply what you've learned in class to a meaningful problem. I'll provide a suite of choices on topics, and you will be able to choose which you would like. In addition to turning in responses to the assignment in text/image form, I will schedule a private 5-10 minute conversation with each of you to talk about the project and what you learned from it. The conversation is designed to help you reflect on what you have learned and to help me evaluate how to teach better in the future. (In other words, it is not an oral exam.) (10 points total)

*Example Workflow 1: (visual start)*

- Watch the videos and take the quizzes
- Read the LibreText notes
- Look at the homework assignment
- Participate in the class discussion
- Read Nichols
- Do the homework assignment

*Example Workflow 2: (reading start)*

- Read Nichols
- Look at the homework assignment
- Watch the videos and take the quizzes
- Participate in the class discussion
- Read the LibreText notes
- Do the homework assignment

*Example Workflow 3: (task-motivated start)*

- Look at the homework assignment
- Watch the videos and take the quizzes
- Read the LibreText notes
- Participate in the class discussion
- Read Nichols
- Do the homework assignment

*Example Workflow 4: (interactive start)*

- Watch the videos and take the quizzes
- Look at the homework assignment
- Participate in the class discussion
- Read the LibreText notes
- Read Nichols
- Do the homework assignment

Attending office hours between any of the steps is highly recommended.

### Discussion Schedule and Reading Assignments:

Date	Topic	Nichols			
			May 1	Marine Processes	11
			4	Deltas	12
March 30	Introduction	1	6	Estuaries & Other Coasts	13
April 1	Sediment Transport I	2-4	8	Sandy Seas	14
3	Sediment Transport II	2-4	11	Carbonates & Reefs	15
6	Sedimentary Structures	4.3-4	13	Deep Marine Environments	16
8	Environments & Facies	5	15	Lithification	18
10	Stratigraphy & Time	19	18	Interpreting Strat Columns II	-
13	Weathering & Erosion	6	20	Sedimentology on Mars	-
15	Mass Flows	4.5	22	Biostratigraphy	20
17	Glacial Environments	7	25	Holiday	
20	Aeolian Environments	8	27	Magnetostratigraphy	21
22	Rivers I	9	29	Sequence Stratigraphy I	-
24	Interpreting Strat Columns I	-	June 1	Sequence Stratigraphy II	23
27	Rivers II	9	3	Sequence Stratigraphy III	-
29	Lakes	10			

**My Responsibilities:** I am taking responsibility for preparing for preparing the videos, writing the quizzes and homework assignments, designing reasonable and meaningful final projects, integrating the various materials to help you learn the most important information, and responding to suggestions from you. I am also responsible for making sure the class discussions are useful, inclusive, and respectful of each participant.

**Student Responsibilities:** You are responsible for preparing for discussions by watching the videos and looking at the homework in advance, participating in the discussions to the extent you find useful, and asking questions when something is unclear or you would like more information. I also appreciate feedback on both good and bad aspects of the course, particularly given its new format.

**e-mail List:** I use the UC Davis e-mail class lists 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. However, each student must do and turn in their own work. Also, sketches, etc. should be your own work. 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!