GEOL 106LRS: Earth and Space Science
For future teachers: Monday/Wednesday 12:30-1:45 pm

Instructor Information

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Office Hours
Location: LO 1214
Tuesday 12:30-2:30 pm
Wednesday 2:00-4:00 pm

Email: brittany.huerta@csun.edu

Bring To Class
• Lecture tutorials
• Your course notes
• A device to participate in digital experiences.

A class for future teachers

If you want to be a teacher, it's time to start thinking like one. During this class, we will switch back and forth between thinking like students, scientists, and teachers. The course is officially listed as a "lecture course," but be prepared to do active participation by yourself and with your team. We'll include a number of techniques, including:

- **Lecture-tutorials.** Learn about common science misconceptions your future students might have.
- **Challenge problems.** See how scientific knowledge gets applied to new and complicated situations.
- **K-12 lessons.** You do the teaching!

Teaching is one of the most gratifying professions you can imagine, but it is also serious and challenging work. Teachers often spend more time with their students than many parents, and over a career you might deeply touch over a thousand lives (parent to over a thousand children!). You therefore have the responsibility to be a positive role model. You can't be late (or if you are, you'll be fired). You can't yell every time you get a little frustrated (or if you do, you'll be much less effective). You can't lie (your students will always catch you). In many cases, you can't even go to the bathroom. Teachers are superstars. If you want to be one, now is the time to start practicing these skills of excellence. This class has high expectations for learning and integrity, and low tolerance for excuses.

Team based learning

Research shows that you can learn more from your peers than you can from professors. To facilitate this learning, you will spend a good portion of the class working in teams. You will work with the same team the entire semester, and you will not be able to choose your team. Since having unprepared teammates can impact your experience, there is a procedure for "firing" a student from your team posted on the Canvas website for our class. In past experience, we rarely need to employ this policy. Almost all required teamwork will be in class, so there is no need to worry about coordinating your schedules.

Fine Print

It is the responsibility of each student in this course to know and follow all written guidance given by the instructor in this class.

These policies and schedules are subject to change in the event of extenuating circumstances.

Special needs

I am committed to accommodating those with special physical or learning needs. Please let me know.

Electronic Equipment

You are in charge of your own education. Many people think they can multi-task effectively, but are rarely successful at it. Making phone calls, text messaging, or web surfing in class sends the message "I do not care about my education enough to focus on it for the short duration of class.” If you want to make that statement to people evaluating you like your professor and teammates, feel free. They will notice and I will notice. The choice is yours.
Grades
The grading policy in this class gives merit to four general areas:

- Your **individual mastery** of course material.
- Your **team's mastery** of course material. Assessed throughout the semester as team-based challenge problems, quizzes, & exams.
- Your **contributions to the team**. Includes being prepared, asking questions, helping teach other teammates, and helping answer questions. Assessed by peer evaluations once during term and once at end of the term.
- Your **ability to teach** all members of the team, assessed by two methods: 1) You will teach one K-12 lesson to your team

I will calculate your grade using the categories in the table above. Numbers in parentheses indicate what portion of that category is based on your individual grade versus team grades.

<table>
<thead>
<tr>
<th>Category</th>
<th>15%</th>
<th>75%</th>
<th>25%</th>
<th>7 total, drop 1 lowest</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAP's</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Concept maps</td>
<td>15%</td>
<td>100%</td>
<td>-</td>
<td>7 total, drop 1 lowest</td>
</tr>
<tr>
<td>Other HW</td>
<td>10%</td>
<td>100%</td>
<td>-</td>
<td>~7 total, drop 1 lowest</td>
</tr>
<tr>
<td>K-12 Microteaching</td>
<td>15%</td>
<td>100%</td>
<td>-</td>
<td>1 total – don’t miss it!</td>
</tr>
<tr>
<td>Peer evaluation</td>
<td>15%</td>
<td></td>
<td></td>
<td>2 during the semester</td>
</tr>
<tr>
<td>Quizzes</td>
<td>15%</td>
<td>75%</td>
<td>25%</td>
<td>7 total, drop 2 lowest</td>
</tr>
<tr>
<td>Final Exam</td>
<td>15%</td>
<td>75%</td>
<td>25%</td>
<td></td>
</tr>
</tbody>
</table>

Plus-minus grading will be utilized for this course based on converting the course average to grades as follows:

<table>
<thead>
<tr>
<th>Letter</th>
<th>90-100</th>
<th>80-89</th>
<th>70-79</th>
<th>60-69</th>
<th>50-59</th>
<th>&lt; 50</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>93-100</td>
<td>B</td>
<td>C</td>
<td>D</td>
<td>E</td>
<td>F</td>
</tr>
<tr>
<td>A-</td>
<td>90-92</td>
<td>B-</td>
<td>C-</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Rounding:** I will round your score to the nearest integer (i.e., 89.5000 rounds up, but 89.4999 rounds down).

Academic dishonesty, copying, cheating
I expect high standards of academic integrity from future teachers so there is a zero-tolerance rule for academic dishonesty in this class. I refer all cases of academic dishonesty (including copying, allowing others to copy your work even with modifications, plagiarism, copying/pasting text from the internet even with modifications, misrepresentation of others’ work as your own, accidental failure to cite your source, etc.) to the VP of Student Affairs’ office for arbitration and possible disciplinary action. The first offense will result in, *at minimum*, the reduction of your final grade by one partial letter grade (A- becomes B+), the second offense will result in an F for the class. It is not worth the risk to cheat or let another student copy your work in this class.

You are encouraged to work together, but please be aware that there is a fine line between working together and copying another’s work. To help resolve some of the ambiguity, I have posted a checklist for collaboration on Canvas.

Absences
Class time is important for this course. During many class sessions, we apply our knowledge to interesting challenge problems. The solutions to these problems and the material we discuss are not available in any written resource. When you miss class, you miss the opportunity to participate in this part of the learning process.

When you miss a class:
- **DO** contact your teammates. They determine 10% of your course grade based on your contributions to the team. You are accountable to them when you do not show up. If you have justifiable excuses and good overall attendance, they will be understanding.
- **DO** ask your teammates for notes and information about what you missed.
- **Do NOT** contact the professor.
To account for the fact that you may need to miss class a few times during the semester for any number of reasons, we drop the lowest scores in RAP, Concept Map, HW, and Quiz categories. We drop about 1 out of 7 activities in the class, which is quite generous. Extenuating circumstances for extended sickness, etc., are considered on a case-by-case basis.

Late Assignments
Late assignments are not accepted. Assignments are due at the beginning of class and most can be submitted digitally on Canvas.

If You Miss Microteaching
You must
1) You notify me in advance. As a teacher, you can't simply not show up. You call your school and tell them so that they can schedule a substitute teacher ASAP. You must notify me at least 20 minutes before the start of class. Program my email into your cell phone just in case!

AND
2) You have a valid and documented excuse. Participation in organized CSUN events (athletics or other) are typically considered valid excuses, if notification is given in the beginning of the semester. Bring a copy of the doctor or plumber's bill, etc.

Credit and penalties for missed microteaching:
If you meet the above criteria, I will either try to find another time for you to teach or provide an alternate assignment for you.

Extra Credit
The goal is for you to invest your effort into the regular work all semester long. I do have a few opportunities this semester to visit K-12 classrooms to help deliver Earth science lessons. These experiences will complement your in-class work and deserve extra credit. They will be schedule-dependent, and there is no alternate extra credit assignment for students whose schedule does not allow for participation. Sorry!

Dropping
Read the Schedule of Classes. If you decide that you don’t want to continue with this course, you must drop the class – you will not be dropped automatically if you simply stop showing up.

"Incomplete", Withdrawal from the Course, Change Of Grade
The Department Chair insists that the faculty adhere to the "incomplete" and "withdrawal" policies and deadlines published in the Schedule of Classes.

Readiness Assessment Procedure (RAP)
RAP's are quizzes given at the beginning of the class period designed to test if you have done the reading and are ready to apply it to interesting and challenging problems with your team. They have a set time limit. They CANNOT BE MADE UP and time extensions are not granted except to students with special needs (upon proper documentation). If you don't do the reading before class, you won't do well on the RAP's.

TIPS FOR DOING WELL

Preparation. Do the reading carefully. Class time is for applying concepts and not for simply revisiting or re-telling the material in the book. Much of the reading material will not be repeated in class, but it will be essential for challenge problems and will appear again on exams (and CSET exams for teachers).

Take responsibility for your own learning in class. Don't just let your teammates do the work while you sit back. If you don't understand something, ask them questions. When you don't understand material, it can hurt your team's score.

Contribute to your team. Everyone has something valuable to contribute to the team. If you often know the answers, hold back and wait for others to participate. If you are struggling, don't be afraid to speak up.

* Portions of this syllabus are copied from a model for this class by Professor Doug Yule, 2009.
Overview of Assignments
This class works on a learning progression – making sure you have the basics down before you jump into some challenges. Each two-week unit follows the same basic pattern.

<table>
<thead>
<tr>
<th>What it is</th>
<th>Purpose</th>
<th>Gets you to think like a...</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Micro-teaching</td>
<td>One team member teaches a prepared elementary school science lesson that I provide to the rest of the team.</td>
<td>Show you how the ideas are commonly presented in K-12 curriculum. See how your knowledge will help you in the classroom.</td>
<td>teacher</td>
</tr>
<tr>
<td>Challenge Problems</td>
<td>Your team applies its knowledge to new situations like real scientists.</td>
<td>To show some of the real questions that scientists try to answer. To get you to think about solving scientific problems.</td>
<td>scientist</td>
</tr>
<tr>
<td>Lecture-Tutorials</td>
<td>10-15 minutes of introductory “lecture” followed by a series of questions of increasing difficulty.</td>
<td>Targets difficult concepts and typical student misconceptions.</td>
<td>a teacher and a student (you’ll be able to see both sides)</td>
</tr>
<tr>
<td>Readiness Assessment</td>
<td>Individual and team quiz</td>
<td>Makes sure that you have done your homework to learn essential vocabulary &amp; basic concepts. Ensures that you have an introduction to the concepts and roadmap of what we need to know.</td>
<td>Well prepared university student</td>
</tr>
</tbody>
</table>

As part of this process, there are 3 main types of assignments that you will be required to complete outside of class time. The next few pages outline key facts about them:
RAP Quizzes
These are fact-based, multiple choice reading quizzes taken on Canvas prior to the first class we discuss the material. You will complete one RAP quiz for each of the eight sections in the course.

Goals and motivation for RAP Quizzes
- The textbook introduces fundamental ideas and a common vocabulary for us to use in class.
- Being quizzed on the material in advance forces you to come to class prepared.

Logistics
- You complete your individual RAP quiz online using Canvas.
- The team portion is completed in class.

You can make unlimited attempts at the individual portion – one MUST occur before the team exam and the rest must occur after. Canvas is set so that you must wait a full week between attempts. This ensures that you get spaced practice, which promotes long-term retention! Everyone should score 100% on the subsequent attempts because we discuss the answers in class. Your individual score is the average of all your attempts. If you do really well on the first attempt, you are not required to make a second attempt. However, you’ll find that your score on the final will be better if you regularly practice the quizzes with repeated attempts. They only take a few moments to complete once you know the answers!

Assessment
Your grade is 75% individual and 25% based on your team’s performance. Here is how your individual score is calculated:

<table>
<thead>
<tr>
<th>You did...</th>
<th>Your individual score will be recorded as...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Completed Attempt 1 only</td>
<td>Score in Attempt 1</td>
</tr>
<tr>
<td></td>
<td>Did well on Attempt 1? Great!</td>
</tr>
<tr>
<td>Completed Attempts 1 + 2</td>
<td>Average of Attempts 1 &amp; 2</td>
</tr>
<tr>
<td></td>
<td>Increase your score by taking the optional 2nd attempt! You must wait at least 48 hours after your first attempt for your second attempt to count.</td>
</tr>
<tr>
<td>Completed Attempt 2 only</td>
<td>Zero</td>
</tr>
<tr>
<td></td>
<td>You must complete your first attempt before the Team RAP.</td>
</tr>
</tbody>
</table>
Concept Maps

Concept maps are graphical ways to organize and present information. They are more than just outlines of information because they illustrate complex connections between ideas. You will complete one concept map for each of the eight sections in the course.

You will be able to bring your concept maps to each of the exams, so there is motivation to construct them well!

Goals and motivation for Concept Maps

• You retain information better when you connect ideas to one another.
• Requiring a concept map requires you to revisit the information in the chapter.
• You can refer to your concept map years from now when you are a classroom teacher.

Logistics & Assessment

• *Concept Map 1*: I provide a concept map for the first section on Earth’s history and layers. You complete an assignment on Canvas to reflect on how concept maps organize information.
• *Concept Map 2*: I provide a list of concepts and you connect them to make your first attempt at a concept map. A rubric for grading is available on Canvas.
• *Concept Maps 3-6*: You construct your own concept maps from scratch. I will use a different grading rubric from the previous assignment, also available on Canvas.
• *Concept Maps 7-8*: You will construct your own concept maps from scratch. Your teammates will evaluate the completeness of your concept map but they will not assign you a score. You receive credit for submitting the concept map and for completing an assessment of your peers’ concept maps. Bonus points will be awarded to the author of the concept map that your team selects as the “best” and also for effective grading.

You have 2 options for submitting your concept maps:

1. Construct concept map with paper and pencil and scan it/take a digital photo.
2. Construct concept map on computer. The best files are PDF, but .cmap files and MS Office files work well too.

Concept maps must be submitted as a file uploaded to Canvas by the start of class on the day they are due. If you run into technical problems at the last minute, emailing a digital copy or bringing in a hardcopy at the start of class is OK. But please do learn how the uploading system works because maps that are not in the automated system are at risk of being lost or not receiving credit. I will always correct these book-keeping mistakes when I find out about them, but it's best to avoid them!

Remember: You do NOT have to construct your concept map on the computer. Hand-drawn concept maps are great! Just take a snapshot of your map and upload a clear picture to Canvas.

POLICY ON CONCEPT MAP COLLABORATION

Concept maps should reflect your own understanding of the course ideas and how they relate to one another. It is highly unlikely that your brain thinks about things the same way as other students, so create your own maps. Remember that you can use them on our course quizzes and the final exam, and a map will be a lot more useful if you create it yourself. Concept maps that are unacceptably identical will be treated as academic integrity infractions (see course syllabus).
K-12 Microteaching
Each member of your team will teach at least one K-12 lesson during the course. I provide the lesson plan and you teach your mini “class” that consists of your team – the same people you’ve been building relationships with all semester long.

You will sign up for a specific date from the choices given to your team sometime in the first two weeks of the semester. If you need to change dates (even at the last minute), coordinate with your teammates so that someone is ready to teach the lesson.

Goals and motivation for microteaching
• You learn material best when you have to teach it.
• You must start thinking like a teacher if you are going to take control of a classroom in a few years. This takes practice.
• Microteaching provides you a safe environment to practice science teaching in a small setting.
• I provide the lesson plans, so the focus is on teaching the lesson effectively, not designing a lesson from scratch.
• You will get specific, instant feedback from your teammates.

Logistics:
• Lesson plans are available online.
• One week before your lesson, I will provide a paper copy of the lesson plan and some of the materials. You will need to return these at the end of microteaching.
• For lessons that require additional materials, I will provide them to you when you arrive on the day of your microteaching.
• You must be prepared to start your lesson 5 minutes after the normal start of class.
• You must complete your lesson in the allotted time (typically 45 minutes).
• You may deviate from the given lesson as much or as little as you like.
• You may provide additional visual aides.
• You must make any photocopies of student worksheets that you want your students to use.

Assessment
• Your teammates will complete an anonymous feedback form.
• The feedback form is available on Canvas in advance for you to consult.
• Feedback includes written comments and numerical rating scales.
• Your score, which accounts for 10% of the grade is based on the numerical rating scales given to you by your teammates.

Additional Notes
In the event that there is some threat to the school during finals and we cannot take our exam during the scheduled time frame, our final will be completely online in Canvas.