Course Overview
This course will focus on preparing pre-service teachers to plan learning segments (and curricular units) to be used for science teaching. We expect that teachers in this course will not necessarily be subject matter experts, but they will still be expected to use their knowledge of teaching to transfer to science content. Specifically, in this intensive introduction to the teaching of science we will endeavor:
• To convey and practice the cognitive apprenticeship model as we understand it in the context of science teaching.
• To be able to read and interpret the NGSS in order to effectively plan effective learning experiences in science content.
• To prepare all pre-service teachers to design lesson plans, learning segments, and eventually, curricular units, that create deeply integrated learning segments that enable students to understand and apply their conceptual understanding based on their understanding of students’ skills, backgrounds and needs,
• To prepare all students to analyze and assess the impact of their planning strategies on student learning in an effort to revise and improve their instructional performance.

Course Expectations
This course is designed to create a collegial culture in which we can all learn from one another. To facilitate this culture, we expect everyone to come to class having completed the readings for that session and to be prepared to participate in activities and discussions. Candidates are expected to demonstrate the same level of professionalism as demanded of any credentialed teacher with respect to time management, communication, and integrity. We also expect people to listen carefully and respectfully to their colleagues. Our collective engagement in class activities and discussions will facilitate your learning; we therefore assume regular attendance. Absences are for major illness or family emergencies only. In such instances, students are responsible for contacting instructors at least 24 hours before class and completing any work missed due to absence. All readings will be available on Canvas. Missing more than one class session may result in a grade reduction.

Course Assignments
Video capture of student think-aloud due April 18
Cross-content observation slideshow due May 16
Lesson plan presentation due June 6

Grading
Our expectation is that everyone will achieve mastery of the material taught in the course. To that end, we will invite you to revise and resubmit assignments in a timely manner if mastery is not the outcome upon the first submission. The other major component of the grade is participation and engagement during class time. Please read each week’s reading carefully and fully before coming to class and have it readily accessible during each class. Because of your edTPA, job search, and independent student teaching in the spring, we have limited the readings significantly (typically only one per week or two shorter pieces each week) to ensure that this elective is manageable considering all of your other
obligations in the spring. Assignment extensions may be granted by your instructors, if requested. Late work that is submitted without an extension may be subject to a grade reduction.

**Students with Documented Disabilities**

Students who may need an academic accommodation based on the impact of a disability must initiate the request with the [Office of Accessible Education (OAE)](http://example.com). Students should contact the OAE as soon as possible since timely notice is needed to coordinate accommodations.

**Honor Code**

1. The Honor Code is an undertaking of the students, individually and collectively:
   a. that they will not give or receive aid in examinations; that they will not give or receive unpermitted aid in class work, in the preparation of reports, or in any other work that is to be used by the instructor as the basis of grading;
   b. that they will do their share and take an active part in seeing to it that others as well as themselves uphold the spirit and letter of the Honor Code.
2. The faculty on its part manifests its confidence in the honor of its students by refraining from proctoring examinations and from taking unusual and unreasonable precautions to prevent the forms of dishonesty mentioned above. The faculty will also avoid, as far as practicable, academic procedures that create temptations to violate the Honor Code.
3. While the faculty alone has the right and obligation to set academic requirements, the students and faculty will work together to establish optimal conditions for honorable academic work.

**Violations of the Honor Code**

Examples of conduct that have been regarded as being in violation of the Honor Code include:

- Copying from another’s examination paper or allowing another to copy from one’s own paper
- Unpermitted collaboration
- Plagiarism
- Revising and resubmitting a quiz or exam for regrading, without the instructor’s knowledge and consent
- Giving or receiving unpermitted aid on a take-home examination
- Representing as one’s own work the work of another
- Giving or receiving aid on an academic assignment under circumstances in which a reasonable person should have known that such aid was not permitted
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<th>Date</th>
<th>Topic</th>
<th>Readings for this class</th>
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<td>Day 2: 4/11</td>
<td><strong>Why teach Science?</strong>&lt;br&gt;- How have the opinions of teachers and society changed over time and changed our focus on how and what to teach in science classrooms?</td>
<td>Wysession, Michael. Why schools should teach science like sports. Scientific American. August 1, 2105&lt;br&gt;Why is Science Important? Website <a href="http://whyscience.co.uk/">http://whyscience.co.uk/</a></td>
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<td>Day 4: 4/27 (Class moved to Thursday!!)</td>
<td><strong>How does it all fit together? Cross cutting Concepts and Disciplinary Core Ideas:</strong>&lt;br&gt;- How are the 3 dimensions of science woven together to make a stronger science education?&lt;br&gt;- Why is it important to know the wrong answers? or How can you find the right in the wrong answers?&lt;br&gt;- What is the role of backwards planning in science?</td>
<td>A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas. Peruse Chapter 4: Dimension 2 Cross Cutting Concepts&lt;br&gt;And review the section of the chapter of the recently adopted CA State Science standards that you are most interested in. Chapter 7 (chapter 5 is middle school)&lt;br&gt;The Living Earth pg 11-122&lt;br&gt;Chemistry in the Earth System pg 123-219&lt;br&gt;Physics in the Universe pg 220-343</td>
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| Day 6: 5/9 | Defining Problems and Designing Solutions: What is Design Thinking in Science?  
- What types of problems can we solve with science and engineering?  
https://onlinelearninginsights.wordpress.com/2013/08/06/why-design-thinking-doesnt-work-in-education/  
Design Thinking for Educators Website https://designthinkingforeducators.com/ |
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| Day 7: 5/16 | Modeling and Interpreting Data:  
- What is considered a model in science?  
- When do we interpret data in real life? What counts as data?  
| Day 8: 5/23 | Discourse and Argumentation:  
- Why argumentation and why in science?  
Additional Resources:  
TedED: Derek Muller, The founder of Veritasium. Video series.  
http://ed.ted.com/on/rTabZlkM#watch  
http://americanradioworks.publicradio.org/features/tomorrows-college/lectures/  
| Day 9: 5/30 | Science and Society:  
- What is going on with science and society?  
- When do we think about science and how does this connect to scientific literacy and why it would be important?  
Vedantam, Shankar. NPR. March 14, 2017. Why piling on facts may not help in the battle against fake news. (audio news story)  
Additional Resource:  
| Day 10: 6/6 | Lesson Plan Project Sharing  
**Assignment Due: Final lesson project** | Refer to assignment sheet for lesson plan enactments |