



**Department of Education
MATTC Program
EDUC 288B (3 units)
Secondary Science Methods II
Winter 2024**

Professor: Dr. Won Jung Kim (wkim2@scu.edu)
Course Meeting: Tue. 5-8 PM
Classroom: Guadalupe Hall, 206
Office Hours: Tue. 2:30-4:30 pm, 8-9pm, In-person or via Zoom.

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Land Acknowledgment

We acknowledge that Santa Clara University sits on the land of the Ohlone and Muwekma Ohlone people. We remember their continued connection to this region and give thanks to them for allowing us to live, work, learn, and pray on their traditional homeland. We offer our respect to their Elders and to all Ohlone people of the past and present.

Mission and Goals

Mission and Goals of the Department of Education

Rooted in the Jesuit tradition at Santa Clara University, the mission of the Department of Education is to prepare professionals of competence, conscience, and compassion who will promote the common good as they transform lives, schools, and communities. Our core values of reflective practice, scholarship, diversity, ethical conduct, social justice, and collaboration guide both theory and practice. Faculty, staff, and students in the Department of Education:

1. Make student learning our central focus
2. Engage continuously in reflective and scholarly practice
3. Value diversity
4. Become leaders who model ethical conduct and a commitment to social justice
5. Seek collaboration with others in reaching these goals

MS/SS Teaching Credential Program Learning Goals (PLGs)

The PLGs represent our commitment to individuals who earn their MS/SS credential at Santa Clara University. The MS/SS faculty focus on ensuring each student will begin their teaching career ready to:

1. Maximize learning for every student.
2. Teach for student understanding.
3. Make evidence-based instructional decisions informed by student assessment data.
4. Improve your practice through critical reflection and collaboration.
5. Create productive, supportive learning environments.
6. Apply ethical principles to your professional decision-making

The PLGs guide our program. Therefore, all MS/SS teaching credential program course objectives are cross-referenced with the PLGs (A fully elaborated version of the MS/SS PLGs can be found in the Teacher Candidate Handbook, Pre-Service Pathway).

Course Description

This course continues the work undertaken in EDUC 288A (Secondary Science Methods I) to develop and refine instructional design techniques and strategies for implementing effective programs of study for secondary science students. In addition, the course is designed for engagement with current issues, challenges, and opportunities associated with science teaching and learning at the secondary level, with particular emphasis on the assurance that all students have opportunities to learn the core ideas, practices, and crosscutting concepts (as outlined in state and national standards documents), while leveraging students' interests, prior knowledge, and lived experiences.

Here, I use the term *all students* in coherence with the inclusive definition of California Teacher Performance Assessment Guides: as students

- who may exhibit a wide range of learning and behavioral characteristics, as well as disabilities, dyslexia, intellectual or academic advancement, and differences based on ethnicity, race, socioeconomic status, gender, gender identity, sexual orientation, culture, language, religion, and/or geographic origin, and
- whose first language is English, English learners, and Standard English learners.

This course is grounded in three frameworks for what to learn to teach science:

- who students are in science learning spaces: exploring what it means for students to exercise rightful presence as legitimate constructors and critics of science knowledge and practices, paying particular attention to rightful presence of students with exceptionalities in LRE;
- how teachers can support students' science learning: exploring 5-E instructional model to pedagogically support students' sense-making and critical use of science knowledge and practices;
- what counts as science that matters and that students want/need to learn and do: exploring three-dimensional learning aligned to the *Next Generation Science Standards*; particularly with regard to 'science that matters', we explore how to integrate environmental justice issues and sustainability goals into instructional designs and student learning.

We engage in the discussions and activities about these frameworks. I hope these frameworks help you establish your own pedagogies through working on the three main assignments of the course as introduced on the following page. The assignments are also designed for you to work on your TPA and ultimately get ready for your long-term career as a secondary science teacher.

Course Objectives

This course will create opportunities to develop students' knowledge of or skills with...	<i>Standard/Goals Addressed</i>			
	<i>DG</i>	<i>PLG</i>	<i>TPE</i>	<i>MMSN</i>
The scope and sequences of respective secondary science courses in terms of content and processes based on state and national standards, focusing on a balanced approach that addresses all aspects of scientific conceptual development at the secondary level including instructional sequences, unit and lesson plans, in order to provide students with disabilities equitable access to the content and experiences aligned with the state-adopted core curriculum.	1	1, 2	1.1, 3.2	1.1, 1.2, 2.1, 2.10, 4.2, 4.4, 4.5, 5.6
The disposition necessary to make instructional decisions (e.g., task selection and adaptation, opportunities for collaborative learning and authentic scientific practice, differentiation) that promote a positive climate for learning and meet the instructional needs of diverse learners (e.g., English Learners, students with special needs) by leveraging students' interests, prior knowledge, and lived experiences and collaborating with families and appropriate related services personnel to support access to, and optimal learning experiences for students.	1, 3, 4	1, 2, 5, 6	1.3, 2.5, 3.2, 4.4	1.2, 1.7, 2.1, 2.10, 4.2, 4.5, 5.6
Gathering data about student progress toward content standards by using and reflecting upon instructional strategies that assess student learning throughout the learning process including strategies based upon the unique profile of students.	1, 2	3, 4	1.8, 4.4, 5.2, 5.3	2.1, 2.10, 4.5
Planning, teaching, and reflecting upon lessons in respective content areas, which are built around models of how people learn that identify and use behaviorally based teaching strategies with the understanding that behaviors are communicative and serve a function.	1, 2	1, 2, 4	1.5, 3.3, 4.4, 4.7, 6.1	1.1, 4.3, 4.4, 4.5
Engaging with peers, master teachers, and the larger professional community of science practitioners and researchers to construct and maintain a learning environment committed three-dimensional science learning and social justice.	4, 5	4, 5	3.6	2.1, 2.10, 4.3, 4.4, 4.5

Resources

All readings are available online (linked) in the class Google folder. See Appendix C for additional resources.

Required texts (Before-class tasks)

- Allchin, D. (2020). From Nature of Science to Social Justice: The Political Power of Epistemic Lessons. In *Nature of Science for Social Justice* (pp. 23-39). Springer, Cham. DOI: 10.1007/978-3-030-47260-3_2
- Duncan, R. G., Chinn, C. A., & Barzilai, S. (2018). Grasp of evidence: Problematizing and expanding the next generation science standards' conceptualization of evidence. *Journal of Research in Science Teaching*, 55(7), 907-937. <https://doi.org/10.1002/tea.21468>
- Mutegi, Jomo W., Demetrice Smith-Mutegi, and Nicole Lewis. "Fostering Critical Perspectives of Science among Preservice Elementary Teachers: An Empirical Identification of Affordances and Hindrances." *Journal of Science Teacher Education* (2022): 1-22.
- NSTA featured resources for STEM class with exceptional students: <https://www.nsta.org/topics/disabilities>

Class activity references

General

- [Teaching Tools for \(STEM\) Education](#)
- [Social Justice Mathematics and Science Curricular Resources for K-12 Teachers](#)
- [Working Together: Science Teachers and Students with Disabilities](#)

CER and Epistemic talk

- Chowning & Peterman (2015). Beyond the Written C-E-R: Supporting Classroom Argumentative Talk about Investigations
- Eve Manz (2019). Designing 'productive uncertainty' into investigations to support meaningful engagement in science practices
- Hunter-Thomson, K. (2021). How Can We Use and Interact with Graphs Better? (Data Literacy 101) Breadcrumb. *Science Scope*, 44(6).
- Kim, W. J., & Alonzo, A. C. (2021). Undergraduates' Grasp of Evidence for Evaluating Scientific Knowledge Claims Associated with Socio-scientific Issues. In *Engaging with Contemporary Challenges through Science Education Research* (pp. 149-160). Springer, Cham. https://doi.org/10.1007/978-3-030-74490-8_12
- Odom, A. L., & Bell, C. V. (2021). Shaking out Probability. *Science Scope*, 44(5).

Assessment

- [Integrating Science Practices into Assessment Tasks](#)
- Penuel & Van Horne (2018). Prompts for Integrating Crosscutting Concepts into Assessment and Instruction
- Morrison & Haydel DeBarger (2016). How can formative assessment support culturally responsive argumentation in a classroom community?

Interdisciplinary & STEM

- Escude et al. (2015). Learning STEM Through Design: Students Benefit from Expanding What Counts as "Engineering"
- Shouse & Lakhani (2014). Failing Forward: Managing Student Frustration During Engineering Design Projects
- Weaver et al. (2019). Students should generate criteria and constraints for engineering design problems—not just be provided with them

Safety

- [Safety practices and regulations: Safety in the Media: Science Activity Safety Checklist](#)
- [Safety and the Next Generation Science Standards](#)

Assignments Overview

*asynchronous (weeks 1, 7, 9): other weeks are all in person

Week	Assignment: During/After-class tasks	Platform	Pts (100)
1 (1/9)*	1. Review instructor feedback on 288A Lesson Plan	<i>Instructor will send an email individually.</i>	10
2 (1/16)	2. ECJ-integrated unit plan brainstorming	Indv unit plan	5
3 (1/23)	3. 5E-based, NGSS-informed, ECJ-integrated science unit proposal	Indv unit plan	10
4 (1/30)	4. Science in media	Class slide	5
5 (2/6)	5. CER talk activity design	Class slide	5
6 (2/13)	6. Unit plan components 1-2	Indv unit plan	5
7 (2/20)*	7. Unit plan components 3	Indv unit plan	5
8 (2/27)	8. Unit plan components 4	Indv unit plan	5
9 (3/5)*	9. Review Quiz	Camino	15
10 (3/12)	10-1. Course-ending survey	form	5
	10-2. Final unit plan	Camino	30

Course Calendar

*asynchronous (weeks 1, 7, 9): other weeks are all in person

The course calendar details are subject to change.

Session	Before: Read	During: Act	After: Expand
1 (1/9)*		ASYNCHRONOUS 288A Review 1. Review instructor feedback on 288A Lesson Plan	Continue and complete 1
2 (1/16)		From 288A to 288B & NGSS - Greetings - Opening Activity o Phenomena Spotlight o Classroom Scenarios - NGSS standards - Assignment Share-out: Assignment 1	2. Unit Plan brainstorming
3 (1/23)	Watch a teacher video	5E instructional model - Assignment Share-out - Opening Activity o Phenomena Spotlight o <u>Carbon capture, usage, and storage</u> o <u>Gas properties simulation</u> o Classroom Scenarios - Why 5E (Engage, Explore, Explain, Elaborate, Evaluate) for Science Instruction? o Analyze the teacher video in terms of 5E, NGSS, and ECJ	3. Unit Plan Proposal

4 (1/30)	READ: Duncan et al., 2018	<p align="center">Science Talk: Grasp of Evidence</p> <ul style="list-style-type: none"> - Assignment Share-out - Opening Activity <ul style="list-style-type: none"> o Phenomena Spotlight: o Classroom Scenarios - Reading discussion: the Grasp of Evidence - Group discussion: science vs pseudoscience 	4. Science in media
5 (2/6)	READ: Allchin, 2020	<p align="center">Science Talk: Epistemic nature of science</p> <ul style="list-style-type: none"> - Assignment Share-out - Opening Activity <ul style="list-style-type: none"> o Phenomena Spotlight o Classroom Scenarios - Reading discussion: From nature of science to the political power of epistemic lessons 	5. CER talk activity design
6 (2/13)	<u>Choice reading</u> for Jigsaw	<p align="center">Rightfully present science learners</p> <ul style="list-style-type: none"> - Assignment Share-out - Opening Activity <ul style="list-style-type: none"> o Phenomena Spotlight o Classroom Scenarios - Peer teaching: choice reading for jigsaw <ul style="list-style-type: none"> o learners with exceptionalities: science learning in Least restrictive environment o Ask questions to understand your students 	6. Unit plan components 1-2
7 (2/20)*		<p align="center">ASYNCHRONOUS</p> <ul style="list-style-type: none"> - WORK ON: assignment 7. Unit plan components 3 	Continue and complete 7
8 (2/27)	READ Mutegei et al., 2022	<p align="center">Critical Perspectives of Science</p> <ul style="list-style-type: none"> - Assignment Share-out - Opening Activity <ul style="list-style-type: none"> o Phenomena Spotlight o Classroom Scenarios - Reading discussion: Teaching Critical Perspectives of Science <ul style="list-style-type: none"> o Science for or against justice 	8. Unit plan components 4
9 (3/5)*		<p align="center">ASYNCHRONOUS</p> <p align="center">9. Review Quiz & Continue working on the final assignment</p>	Continue and complete 9
10 (3/12)		<p align="center">In-person Unit Design Showcase & Finale</p> <p>Format:</p> <ul style="list-style-type: none"> - Teaching Demonstration Format: 15 min each followed by Peer Feedback <p>10-1. Course ending survey</p>	10-2. Final unit plan document submission (Due: 3/19, Tue. 11:59pm)

Assessments & Grading Criteria

Final grades will reflect your contributions to our community's growth as pre-service teachers, including but not limited to attendance, punctuality, participation in class sessions, completion and quality of course assignments, critical reflection of theory, research and practice.

Attendance and punctuality

Please refer to the performance policies about Attendance, Punctuality & Communication (below at p. 5). Attendance and participation in all class meetings is required. Absence and lack of punctuality can immediately affect your final grades. If you are going to be absent from class, please email me to inform me of your absence. You will still be responsible for any missed content.

Assignments and participation

Your work will be graded according to the criteria specified on the rubrics for each assignment. Grades are based on the quality of work and professional conduct, rather than how one student's work compares to that of his/her peers. Grade concerns will be addressed individually outside of class time. Please contact me via email as soon as a concern arises.

- All assignments are expected on their due dates. I cannot be responsible for papers submitted at other times or in other formats. Unless we have made special arrangements beforehand, late assignments will be subject to a loss of points.
- All written and oral assignments must reflect graduate-level standards. As a future teacher, you must be able to model communication skills for your students.
- For any assignments done in pairs/small groups, both partners/all group members will receive the same grade, unless otherwise stated.

Final letter grades

Final letter grades are assigned on the standard scale based upon a possible total of 100 points (once cumulative course points are converted).

A	94-100	C+	77-79
A-	90-93	C	74-76
B+	87-89	C-	70-73
B	84-86	D+	67-69
B-	80-83	D	63-66

Incomplete grades

Under certain circumstances, a student may request an Incomplete. See the *School of Education and Counseling Psychology Bulletin* for details. If you have any concerns about your ability to fulfill the course requirements by the due dates, contact me right away to explain your situation.

Professional Conduct and Performance Policies

Professional conduct and performance policies are germane to your mastery of TPE 6- "Developing as a Professional Educator." If needed, I may contact you individually and privately to discuss the issue, clarify the expectations, and offer my support in helping you reach those expectations. When you would like specific feedback on your professional conduct during the quarter, you are welcome to contact me at any time and I will be glad to discuss with you. Regarding the performance policies, this section points out the details of attendance, punctuality and communication as well as responsible participation and academic integrity.

Attendance, Punctuality & Communication

Attendance and punctuality are the only policies with the immediate potential to impact your course grades. I as your instructor gather data documenting your adherence to the remaining policies listed here through ongoing observation and documentation.

Attendance. Regular attendance at all class meetings is a requirement in this program. Refer to the following attendance policy.

1) Points deducted from the final grade of the course

- 1 unexcused absence – 20 points deducted from the final grade.
- 2 absences –40 points deducted from the final grade.
- 3 or more unexcused absences – dropped

2) Each of you will be granted 1 Emergency Release (ER) per course. Your ER excuses you from losing points. To use your ER, you must notify me by email or phone BEFORE class. Save your ER for medical issues, family demands, car trouble, etc.

- Points will *not* be deducted if the absences are due to the observance of religious holidays that fall on our scheduled class day; please give me advance notice of these absences so I can make the necessary accommodations.
- Because so much of the course content is learned through participation in class activities and other experiences, it is not possible to make up for missing a class session.
- However, there are ways you can engage with the content, join the conversation, and try to fill the knowledge gaps that are the result of your absence. If you must miss a class session, do the following things:
 - Complete and submit on time all assignments due for the class session.
 - Download and review the PowerPoint presentation and any handouts and discussion notes from class (all posted on Camino).
 - Talk with your classmates to get their sense of the main “takeaways” of the session.

Punctuality. Coming to class (and returning from breaks) on time is another course requirement. Your first late arrival will be excused; your second late arrival will cause 5 points to be deducted from your final course grade; your third late arrival will cause 10 points to be deducted. More than three late arrivals indicate a serious problem; this situation will be dealt with at my discretion.

- Despite excellent grades on assignments and other aspects of professional conduct, you may earn a lower course grade as a result of excessive absence or chronic lateness.
- Knowing that there are times when unexpected circumstances arise that may result in late arrival, please email me ahead of time (or as soon as possible) when this occurs.

Communication. Email and our Camino website will be our primary means of communication outside of class. **You must check your SCU email account and Camino messages every day to ensure you maintain a connection with your classmates and me.** To access course materials and participate in online activities, please be sure to review Camino. Reminders, tools, readings and assignment descriptions will be made available through this on-line course management system. Your SCU username and password gets you access to Camino.

Responsible Participation & Academic Integrity

As we read and study in this course, everyone’s learning is enhanced by the quantity and quality of the interactions in the learning environment. Hence, your participation in whole class discussions, small group, and pair work is essential for the success of this course.

Participation. We, as future teachers working toward equitable education, will engage in respectful, thoughtful participation in class activities and discussion.

- We should take responsibility for our own learning and support the learning of our peers. To fully participate in the course activities, the assignments must be completed before the class session in which they are due. As indicated above, assignments are still due per course outline even in the event of an excused absence and late arrival.
- The quality of our class sessions and the depth of your learning depend directly on your prepared participation. Please be prepared for class as informed by syllabus and in-class announcements.

Responsible use of technology. Electronic devices should be used during class to support learning. While a class is in session, please refrain from engaging in any activity not directly related to what is taking place in the classroom. I may ask you to close your laptop or put away some other forms of technology. In some instances, the inappropriate use of technology in class may result in points being deducted from the final grade. If you would like more detailed clarification about the expectations regarding appropriate in-class technology use, please feel free to contact me for further information.

Academic integrity. Santa Clara University insists on honesty and integrity from all members of its community; see www.scu.edu/academic-integrity for details. You are expected to do your own work and to cite any sources they use. When identified by dishonest acts in an examination, paper, or other required work for a course, or assisting others in such acts, the students will receive a grade of F for the course. In addition, such dishonest acts will immediately dismiss the students from the University. Students that violate copyright laws, including those covering the copying of software programs, or who knowingly alter official academic records from this or any other institution, are subject to disciplinary.

Statement for Equity and Wellness

Respect for diversity. This course serves students from all diverse backgrounds and perspectives. The diversity you bring to this class be viewed as a resource, strength and benefit. I will do my best to present materials and activities that are respectful of diversity: gender, sexuality, disability, age, socioeconomic status, ethnicity, race, and culture. Your suggestions are encouraged and appreciated. Please let me know ways to improve the effectiveness of the course. If any of our class meetings conflict with your religious events, please let me know so that we can make arrangements.

Gender inclusive language. This course affirms people of all gender expressions and gender identities. If you go by a different name than what is on the class roster, please let me know. Using correct gender pronouns is important to me, so I encourage you to share your pronouns with me and correct me if I make a mistake. For more on personal pronouns see www.mypronouns.org

Wellness statement. Jesuit education is grounded in concern for the whole person—mind, body, and spirit— and SCU has many resources and programs to support you. Resources that assist with mental wellness and mindfulness can be found through the Cowell Center and Campus Ministry, to name but a few. University students may experience stressors or setbacks from time to time that can impact both their academic experience and their personal well-being. These may include academic pressure or challenges associated with relationships, mental health, alcohol or other drugs, identities, finances, etc.

If you are experiencing difficulties, seeking help is a courageous thing to do for yourself and those who care about you. If you are concerned with your progress in this class, please contact me so that we can find solutions together. Drahmann Center can also offer support with issues regarding your academic progress more broadly. For personal concerns, SCU offers many resources, some of which are listed on the Cowell Center website. We are here as a support system for one another. Below are some resources and opportunities that can help us further.

Department of Education and University Resources

Academic action plan. Students who are struggling to meet course expectations will be placed on an Academic Action Plan (AAP). The purpose of the AAP is to document the areas of difficulty, the support

to be provided, and the time frame in which the student must improve performance. More information about the AAP is available in the MATTC Handbook.

Disability accommodations. If you have a documented disability for which accommodations may be required in this class, please contact the Office of Accessible Education (OAE) (Benson 1, <http://www.scu.edu/oae>, 408-554-4109) as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through OAE, please discuss them with me during my office hours within the first two weeks of class. Students who have medical needs related to pregnancy may also be eligible for accommodations.

While I am happy to assist you, I am unable to provide accommodations until I have received verification from OAE. OAE will work with students and faculty to arrange proctored exams for students whose accommodations include double time for exams and/or assisted technology. (Students with approved accommodations of time-and-a-half should talk with me as soon as possible). OAE must be contacted in advance to schedule proctored examinations or to arrange other accommodations. OAE would be grateful for advance notice of at least two weeks.

Accommodations for pregnancy and parenting. In alignment with Title IX of the Education Amendments of 1972, and with the California Education Code, Section 66281.7, Santa Clara University provides reasonable accommodations to students who are pregnant, have recently experienced childbirth, and/or have medically related needs. Pregnant and parenting students can often arrange accommodations by working directly with their instructors, supervisors, or departments. Alternatively, a pregnant or parenting student experiencing related medical conditions may request accommodations through OAE.

Writing support. The HUB Writing Center (22 Benson Center) offers a variety of services, such as peer tutoring. For more details, please visit: <http://www.scu.edu/provost/writingcenter/>.

Technology support. SCU can provide you with technology assistance, and you can also reach out to our providers directly for questions. For Camino support, contact caminosupport@scu.edu or call 408-5513572. You can also use the help button within the Camino platform (on the left-hand navigation) for 24/7 support via chat or phone.

- For Zoom assistance, contact Media Services at mediaservices@scu.edu or 408-554-4520. You can also get 24/7 support from Zoom by calling 1-888-799-8854.
- For SCU network and computing support, contact the SCU Technology Help Desk at techdesk@scu.edu or 408-554-5700. They can provide support for MySCU Portal, Duo, ecampus, hardware and software issues, and more.

Course recordings. Online class meetings will be recorded and made available on Camino. As is stated in the existing Student Conduct Code: "...Dissemination or sharing of any classroom recording without the permission of the instructor would be considered "misuse" and, therefore, prohibited. Violations of these policies may result in disciplinary action by the University. At the instructor's discretion, violations may also have an adverse effect on the student's grade."

Discrimination and sexual misconduct (Title IX). Santa Clara University is committed to providing a safe learning environment for all students that is free of all forms of discrimination, sexual harassment, and sexual violence. SCU has dedicated staff trained to support you in navigating campus resources, accessing health and counseling services, providing academic and housing accommodations, helping with legal protective orders, and filing a formal complaint with the university or with law enforcement. Here are key resources:

- [Confidential Survivor Advocate](#), (408) 551-3307;

- Counseling & Psychological Services (CAPS), (408) 554-4501; and
- Equal Opportunity and Title IX Office, (408) 551-3043.

Cases reported to the Office of Equal Opportunity and Title IX are fully investigated. As their investigation is required to be neutral, not to advocate and counsel students who have experienced sexual violence or harassment, SCU (and with the strong support of the Title IX office) has also hired an advocate outside the Title IX office, who is Bree Van Ness, Confidential Survivor Advocate, Wellness Center: bvanness@scu.edu; <https://www.scu.edu/wellness/survivor-advocacy--support/>. A comprehensive list of on- and off-campus Student Resources is available on the Equal Opportunity & Title IX website.

Reporting practices. While I want you to feel comfortable coming to me with issues you may be struggling with or concerns you may be having, please be aware that there are some reporting requirements that are part of my job at Santa Clara University. For example, if you inform me of an issue of harassment, sexual violence, or discrimination, I will keep the information as private as I can, but I am required to bring it to the attention of the institution's EEO and Title IX Coordinator. If you inform me that you are struggling with an issue that may be resulting in, or caused by, traumatic or unusual stress, I will likely inform the campus Student Care Team (SCU CARE). Please be aware that if, for some reason, our interaction involves a disruptive behavior, a concern about your safety or the safety of others, or potential violation of University policy, I will inform the Office of Student Life. The purpose of this is to keep OSL apprised of incidents of concern, and to ensure that students can receive or stay connected to the academic support and student wellness services they need.

Appendices

Appendix A. Descriptions of Assignments

1. 288A Reflection (10 pt.)

The 1st session (January 9th Tuesday) is asynchronous.

Use this asynchronous session for working on this assignment aimed at reminding us of the core contents of 288A. **I will send you an email individually at 5 pm on Tuesday (1/9).**

- Please review instructor feedback on the 288A Lesson Plan you submitted as a final signature assignment for your 288A.
- **You and I will have an individual check-in meeting during the second session (1/16)** to discuss what you reviewed from this assignment.

2. Unit plan brainstorming (5 pt.)

- During the 2nd session,
 - Make your own copy of the unit plan template in the shared folder (folder name: unit plan).
 - Explore the unit plan template and get familiarized.
 - Start working on your unit plan's 2nd Table, Unit Overview.
 - Discuss individually with the instructor about your unit plan idea.

3. Unit plan proposal (10 pt.)

- During and after the 3rd session,
 - Continue working on your unit plan's 2nd Table, Unit Overview. Contents of the first three rows are:
 - Subject and unit title
 - How many lessons does the unit include?
 - Key concepts of the unit
 - Start working on your unit plan's 4th Table, Outlining Lessons, focusing on the first two columns. Contents of the first two columns are:
 - 5E
 - ECJ integration plan details
 - Complete filling in the areas indicated above by 4th session, so as to be presented in class.
- Criteria
 - Each area of the table addressed (2 pts per each)
 - For unmet criteria, partial points (50% per each) are given

4. Science in Media (5 pt.)

- During and after the 4th session,
 - In a slide page(s) of our session 4 slide deck,
 - Introduce one example of pseudoscience or science-in-the-making that can mislead public, intentionally or unintentionally
 1. *What is the example?* Choose an example, if possible, that you once believed but do not now.
 2. *What is the problem?* Analyze what makes the example pseudoscience or science-in-the-making, by referring to evidentiary reasoning (Duncan et al., 2018).
 3. *What's the truth?* Present more reliable explanation on the example.
- During the 5th session, Present your slide page(s).
- Criteria
 - Each of the questions addressed (1 pt each, a total 3 pts), and presented (2 pts).
 - For unmet criteria, partial points (50% per each) are given

5. CER talk design (5 pt.)

- During and after the 5th session,
 - In a slide page(s) of our session 5 slide deck,
 - Design a potential CER discussion activity you can use for the unit you design, by specifying two contents:
 1. Ways to elicit students' CER discussion (e.g., question prompts? Experiment?, worksheet activity?)
 2. Anticipated responses in the format of CER
- During the 6th session, Present the slide page(s).
- Criteria
 - Two contents specified (2 pts per each, 4 pts a total), and presented (1 pt)
 - For unmet criteria, partial points (50% per each) are given

6. Unit Plan Components 1 and 2 (5 pt.)

- During and after the 6th session,
 - Start working on your unit plan's 1st and 2nd Tables.
 - Refer to the assignment evaluation rubric (Syllabus page 15-16).
 - By the 8th session, make sure to conduct a survey (using a paper or digital survey form) to identify your students' academic knowledge and cultural/personal assets related to the unit you design.
- Criteria
 - Each area of the table in progress (1 per each, 3 pts a total) and survey conducted (2 pts)
 - For unmet criteria, partial points (50% per each) are given

7. Unit Plan Component 3 (5 pt.)

- During the asynchronous 7th session,
 - Complete your unit plan's 3rd Table.
 - Refer to the assignment evaluation rubric (Syllabus page 15-16).
 - By the 8th session, draft your initial responses to each of the three questions in the table and present the initial responses.
- Criteria
 - Each area of the table in progress (1 per each, 3 pts a total) and presented in class (2 pts)
 - For unmet criteria, partial points (50% per each) are given

8. Unit Plan Component 4 (5 pt.)

- During and after the 8th session,
 - Start working on the rest part of your unit plan's 4th Table.
 - Refer to the assignment evaluation rubric (Syllabus page 15-16).
 - Before you leave the 8th session, discuss your progress with the instructor before you make the unit design presentation in the last session (10th).
- Criteria
 - Each area of the table in progress (1 per each, 5 pts a total)
 - For unmet criteria, partial points (50% per each) are given

9. Review Quiz (15 pt.)

- During this asynchronous session, take the Review Quiz on Camino.
 - The quiz questions cover the core course content across the previous sessions, and phenomena spotlights explored in every session.

10-1. Course ending survey (5 pts)

10-2. Final unit plan (20 pt.)

- See the appendix B for the detail.
- Format: 8 pages or more (with main text 12pt, single-spaced),
- **Due: 3/19. Tue. 11:59pm**

Appendix B. Assessment Rubric (for the major assignment: Unit Plan)

Component	Exceeding	Meeting	Approaching	Developing
Description of Students' Assets and Learning Needs	All of the following contents are clearly and precisely stated	One or two of the following are moderately addressed, while others are clearly and precisely stated.	All of the following were moderately addressed, or some of them were underdeveloped.	All of the following were underdeveloped.
	Students' pre existing academic knowledge related to the unit (8) How you identified the academic knowledge (2) Students' cultural and personal assets related to the unit (knowledge, experiences, interests, expertise) (8) How you identified the cultural and personal assets (2) Contextual Information for the Class (5)			
	25	24-17	16-9	8-0
Unit Overview	The following contents (NGSS and ELD should be included) are clearly and precisely stated	One or two of the following are moderately addressed, while others are clearly and precisely stated.	All of the following were moderately addressed, or some of them were underdeveloped.	All of the following were underdeveloped.
	Subject, unit title, the number of lessons included (2) Key concepts of the unit (3) NGSS addressed by the unit (20) ELD standards addressed by the unit (20)			
	45-43	42-29	28-15	14-0
Integration Plan (ECJ)	Two to three of the following contents are clearly and precisely stated	One or two of the following are moderately addressed, while others are clearly and precisely stated.	All of the following were moderately addressed, or some of them were underdeveloped.	All of the following were underdeveloped.
	Description of ECJ topics/issues students will learn (10) Reason(s) why you chose the ECJ topics/issues (10) Description of Activities students will do in the unit about the chosen topics/issues (10)			
	30-28	27-19	18-10	9-0
Outlining Lessons (Part 1)	Both of the following contents are clearly and precisely stated	One of the following contents is moderately addressed, while the other was clearly and precisely stated.	All of the following were moderately addressed, or one of them was underdeveloped.	All of the following were underdeveloped.
	5E phase(s) employed in each lesson (10) Description of how the chosen ECJ topic/issue will be integrated in each lesson (10)			
	20-19	18-13	12-7	6-0
Outlining Lessons (Part 2)	All of the following contents are clearly and precisely stated.	One or two of the following are moderately addressed, while	All of the following were moderately addressed, or some of them were underdeveloped.	All of the following were underdeveloped.

		others are clearly and precisely stated.		
	<p>For respective lessons: Academic learning goals that are SMART (specific, measurable, attainable, relevant, timely) (15). Language development goals that are SMART (specific, measurable, attainable, relevant, timely) (15). Your opening question(s) that can elicit students' attention at the beginning of each lesson (15). Description of student activities that include at least two of the following: CER talk, critique of science in media, hands-on, action-oriented (15). Assessment questions aimed to confirm students' achievement of the goals (15).</p>			
	75-73	72-49	48-25	24-0
Outlining Lessons (Part 3)	Consistency across all the unit components (standards, learning goals, assessment, and student activities) was evident.	Consistency across most of the unit components (standards, learning goals, assessment, and student activities) was evident.	Consistency across some of the unit components (standards, learning goals, assessment, and student activities) was moderately addressed.	Consistency across the unit components was missing.
	5	4-3	2-1	0

Appendix C. Additional Resources and Materials

Resources

National Academies of Sciences, Engineering, and Medicine (2015). *Science teachers' learning: Enhancing opportunities, creating supportive contexts*. Committee on Strengthening Science Education through a Teacher Learning Continuum. Board on Science Education and Teacher Advisory Council, Division of Behavioral and Social Science and Education. Washington, DC: National Academies Press.
<http://www.nap.edu/catalog/21836/science-teachers-learning-enhancing-opportunities-creating-supportive-contexts>

[Next Generation Science Standards](#)

[Teaching Tools for \(STEM\) Education](#)

[Social Justice Mathematics and Science Curricular Resources for K-12 Teachers](#)

[Working Together: Science Teachers and Students with Disabilities](#)

[Family Involvement in the Ed Dev. Of Youth with Disabilities](#)

For student-enacted activities: <https://www.howtosmile.org/>

For more practice briefs: Stemteachingtools.org

Specific UDL practices/activities: <https://www.overcomingobstacles.org/portal/en>

“UDL In a Nutshell” <https://www.youtube.com/watch?v=gmGgplQkrVw>

Digital educational resources <https://wakelet.com/wake/UVjkGGmnMPz33u01tNa-2>

California department of education publications and resources

California department of education– Common Core resources for special education
<https://www.cde.ca.gov/sp/se/cc/>

California Commission on Teacher Credentialing (CTC). (2016). California Teaching Performance Expectations. Sacramento, CA: Author.

https://www.ctc.ca.gov/docs/default-source/educatorprep/standards/adopted-tpes-2016.pdf?sfvrsn=8cb2c410_0

California Department of Education (CDE). (2018). Response to Instruction & Intervention (RtI2). Retrieved June 10, 2021, from <https://www.cde.ca.gov/ci/cr/ri/>

[2016 California Science Framework](#)

[California Department of Education website, specialized programs](#)

[Science Safety Handbook for California Public Schools](#)

[Safety practices and regulations; Safety in the Media; Science Activity Safety Checklist](#)

[Safety and the Next Generation Science Standards](#)

Mental Wellness and mindfulness

<https://www.scu.edu/provost/policies-and-procedures/teaching-expectations/>

<https://www.scu.edu/provost/teaching-and-learning/faculty-collaborative-for-teaching-innovation/cafe/caffe-4/#d.en.679541>