SCHOOL OF EDUCATION AND COUNSELING PSYCHOLOGY

Department of Education
MATTC
EDUC 253 (MS) (3 units)
Typical and Atypical Development & Learning
Summer

Professor: Dr. Won Kim
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Class: Tuesday and Thursday
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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:

- Make student learning our central focus
- Engage continuously in reflective and scholarly practice
- Value diversity
- Become leaders who model ethical conduct and a commitment to social justice
- 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 Objectives

This course will develop students' knowledge of or skills with…		*Standard/Goals Addressed*			
		DG	***PLG***	***TPE***	***MMSN TPE***
1	Become more familiar with the scope and sequences of elementary science, health, and physical education in terms of content and processes based on state and national standards, focusing on a balanced approach that addresses all aspects of scientific/health/PE conceptual development at the elementary level.	1	1,2		
2	Continue to develop the skills and disposition necessary to make instructional decisions (e.g., task selection and adaptation, opportunities for collaborative learning and scientific inquiry, differentiation) that promote a positive climate for learning and meet the instructional and socio-emotional needs of diverse learners--English Learners, students with identified disabilities	1,2	1,2, 5	1.3,1 .8,3. 1,3.2 ,3.4, 4.7,5 .2,6. 1,6.5	1.1, 1.2, 1.4, 2.4, 3.2, 4.1, 4.2, 4.3 4.4
3	Gather data about student progress toward content standards by using instructional strategies that assess student learning throughout the learning process.	1	1,2, 3	3.2,3 .4,5. 2	
4	Learn how to prepare, teach, and analytically reflect on elementary school science investigation lessons in which your students ask questions, make predictions, gather evidence, develop explanations, and communicate their ideas in lessons, which are built around models of how people learn. Adopt an asset-based view of students and families, particularly from populations that have traditionally been positioned as low status in science learning.	1	1,2, 3,4, 5	1.8,3. 1,3. 2,4.7, 5.2, 6.1, 6.5	2.1, 2.8, 2.9, 2.10 3.2, 4.4, 4.7, 5.1, 5.2
5	Access, evaluate, and incorporate into your teaching practice a variety of resources from the National Science Teachers Association (NSTA) and other supplementary sources to engage all students, including students with identified disabilities, in rich, complex, and multi-dimensional science learning.	1,2	1,2, 3,4	3.1,3 .2,3. 4,6.1	2.4, 2.9, 2.10, 3.2, 4.3, 4.4, 4.7, 5.1, 5.2, 5.6

***DG**=Department Goals; **PLG**=Program Learning Goal; **TPE**=Teaching Performance Expectation Standard; **TPA**=Teaching Performance Assessment; **MMSN=**

Course Description

This course is designed to assist multiple subject credential candidates in developing the skills necessary to design and carry out science, health, and physical education instruction, demonstrations and laboratory experiences for students in elementary and middle school programs. We will build on current research and best practice in order to foster science/health/PE learning in K-8 students. The process of creating content, developing curriculum, and applying standards to generate meaningful lessons are emphasized with an additional area of emphasis being placed on assessment and collaboration. Scientific inquiry, project-based instruction (PBI), Common Core integration, and Next Generation Science Standards (NGSS) will be emphasized along with best practices in the STEM/Health/PE model. The course also focuses on organizing science/health/physical instruction to meet the needs of students with disabilities in LRE. What does it mean by LRE in the context of secondary science learning? What does the field say about the equitable and justice-oriented learning opportunities for students with different learning goals and needs, including those with disabilities? How do we frame 'disabilities' in science classrooms? Which approaches would you take to support academic achievement not only of general students but also of those in different learning needs? How can you facilitate students to learn and with and from one another?

Course Requirements/Assignments

Major Course Assignments

	Course Requirements/Assignments	Grade %	Universal TPEs	TPE	MMSN TPE*
	Noticing students' presence in science classrooms (NSP)	30	1.1, 1.3, 3.4,	1.1, 1.3, 2.5, 6.1	1.1, 1.2, 4.1, 4.2, 5.1, 5.2, 5.6
	Exploring pedagogical moves (EPM)	30	1.3, 1.4, 2.2, 2.5, 3.2, 3.4, 4.3, 4.4, 4.7, 6.6, 6.6	1.3, 1.5, 4.4, 4.7, 5.2, 5.3, 6.1	.2, 1.7, 2.1, 2.8, 2.9, 2.10, 3.1, 3.2
	Planning and implementing your *science lesson* (PSL)	40	1.3, 1.4, 1.5, 2.5, 3.1, 3.2, 4.3, 4.4, 4.7, 6.5	1.3, 1.5, 1.8, 3.2, 3.3, 4.4, 4.7, 5.2, 5.3, 6.1	1.1, 1.2, 1.4, 2.1, 2.4, 2.8, 2.9, 2.10, 4.2, 4.4, 4.7, 5.1, 5.2, 5.6

Additional details about respective assignments will be discussed in class and posted on Camino.

* See end of this syllabus for assignment and rubric aligned with MMSN TPEs.

Noticing students' presence in science classrooms

This assignment focuses on noticing students as crucial and rightful constructors, critics, and users of science/P.E. knowledge and practices. You will read research papers and practice briefs about students with disabilities' and teachers' experiences in elementary science/PE classrooms and reflect on how their stories contribute to your own development as an elementary science/PE teacher. This assignment entails two components: my science story, and well-remembered events.

NSP component 1:my science story

Introduce/Practice MMSN TPE 1.1, 4.1 5 UTPEs: Practice 1.1, 4.7, 6.1.

This assignment component is intended to position ourselves, science teachers, as lifelong and ultimate learners of science. You will write down your daily discovery and questions of science, which will help

refine understanding content (and pedagogical content) knowledge and how the discovered and interesting science is experienced in the context of your personal life. This contextuality will help you understand that science students learn shapes and is shaped by students' lived cultural lives. Through this assignment component, you are encouraged to

- report your science knowledge and practices deepened and expanded (as to model how you hope your students engage with science in their daily lives, and
- report your science pedagogical knowledge, which means your knowledge as science teachers about varying ways students would understand and explain scientific phenomena, paying attention to the scientific understanding and explanations of ELL students and students with identified/unidentified special needs.

NSP component 2: well-remembered events. One of the hallmarks of a Jesuit education is the practice of reflection. This assignment component offers you to keep engaging in critical reflections of your experiences as a science teacher. You document and reflect on how the students you have encountered via field placements (or your personal educational experiences) position themselves and are positioned in elementary science/PE classrooms. We engage in this assignment as we read, discuss, and reflect on theoretical and practical papers, share placement classroom observations, and further communicate with your master teacher and students. This is a three-part paper that includes

- descriptions of events (three events at minimum),
- accounts of why the events were memorable,
- connections of the events to the literature and resources from this course (and other courses, if any),
- discussions of what impact the events might have on your identity work as a science/P.E. teacher In this report, pay particular attention to:
- how various aspects of your background (e.g., linguistic, cultural, racial, socio-economic, parental involvement, and/or identified disabilities) may have impacted your identification of these events as well-remembered,
- discuss instances in which special needs students' learning can be at stake in elementary science/P.E. classrooms and how such instances can be addressed.

Practice/Assess MMSN TPE 1.2, 4.2, 5.1, 5.2, 5.6 **UTPEs: Practice 1.1, 2.5, 3.4, 6.1**

Exploring pedagogical moves

This assignment focuses on exploring, implementing, and reflecting on pedagogical moves/strategies you can integrate into your science teaching. You may share other pedagogical moves and strategies you/your master teacher have used effectively. This assignment entails two components: master teacher interview, health education inquiry, and pedagogical moves presentation. Additional details about this assignment will be discussed in class and posted on Camino.

EPM component 1: master teacher interview.

The purpose of this assignment component is to explore the learning environment for science that your mentor teacher has created in your classroom. You are encouraged to:

- develop question prompts you will use in the master teacher interview. Some example questions are,
  - how does the teacher think about and work on science teaching?
  - what are the biggest challenges in teaching science in the teacher's classroom(s) at the given school environment?
  - how has the teacher established a culture of intellectual respect?
  - does the physical layout allow all students to participate equitably in science?
  - how has the teacher supported students with identified disabilities?

o what materials for learning science are available in your MT's classroom and/or school? how does the physical and material space allow equitable learning opportunities for ELL students and students with different learning goals and needs?

- conducting interview with MT teacher,
- reflecting on the interview and clearly stating how you will create your future classrooms drawing on your learning from the interview.

Introduce/Practice MMSN TPE 1.7; Practice/Assess MMSN TPE 1.2, 2.1 **UTPEs Practice 2.2, 2.5, 3.4, 6.6**
UTPEs Assess 6.1

EPM component 2: pedagogical moves presentation. This assignment component is aimed to identify and enact pedagogical moves in support of students' engagement in science learning, including science events such as a science field trip. You are encouraged to:

- choose specific content areas you wish to better understand and instruct,
- identify and develop pedagogical moves that can help effectively instruct the content areas,
- identify modifications and supports for ELs and students with identified disabilities that do not lower the cognitive demand of the science, health, or PE task.
- suggest ways to leverage those needs for adaptations as learning opportunities for general students in your science classrooms.
- implement a set of pedagogical moves/strategies in class
- if any, share instructional strategy you/your master teacher have used effectively.

Practice/Assess MMSN TPE 2.8, 2.9, 2.10 **UTPEs: Practice 1.1, 1.3, 1.4 2.5, 3.2, 3.4, 4.3, 4.4, 4.7, 6.6**

EPM component 3: health education inquiry. Students will work in small groups to investigate a health issue or concern that pertains to K-6 students. The issue must be relevant to the student population they teach and must accommodate all students' needs including students with disabilities. Each group will present their inquiry to the class and reflect upon how this assignment informs their teaching of health education.

Practice/Assess MMSN TPE 3.1, 3.2 **UTPEs: Practice 1.1, 1.3, 1.4, 2.5, 3.2, 4.3, 4.4**

Planning and implementing your lesson

This assignment gives you the opportunity to design a lesson plan within one unit of your choice (considering the curriculum implemented in your placement classroom), implement the plan in the classroom, and reflect on the implementation. This assignment helps you practice TPA's lesson cycle (plan-enact-reflect-apply) in support of your student teaching and for your long-term career as an elementary science/PE teacher. This assignment entails two components: science lesson plan, and P.E. lesson plan. Additional details about this assignment will be discussed in class and posted on Camino.

PIL component 1. Science lesson plan: ***Signature Assignment:*** This is an individual assignment supported by forming peer-review groups. Tasks will include:
After teaching the lesson, a written reflection of the experience will be completed.

- aligning a lesson with the specific curricular context of your placement classroom and with NGSS and 5-E instructional model;
- determining where the proposed lesson falls within the science curriculum for the chosen/assigned grade level;

- proposing learning objectives and associated assessment plans to support students' academic and language learning;
- developing student activities and associated learning materials by analyzing demographic information of your students, and knowledge/expertise they bring to the classroom;
- identifying appropriate adaptations to be made in this lesson to meet the needs of English Language Learners and students with identified and unidentified special needs;
- demonstrating the lesson to the class and receiving constructive feedback, and
- reflecting on the demonstration, particularly if and how it can provide students with disabilities equitable access to the content and experiences aligned with the state-adopted core curriculum, particularly students with head injuries through memory processing tasks that support retaining of information.

Introduce/Practice MMSN TPE 1.1, 1.4, 4.2, 5.1; Practice/Assess MMSN TPE 1.2, 2.1, 2.4, 2.8, 2.9, 2.10, 5.1 **UTPEs Practice 1.4, 1.5, 2.5, 3.1, 3.2, 3.3, 4.2, 4.3, 4.4, 4.7, 5.1, 6.5, 6.6 UTPEs Assess 1.5, 4.3, 4.4, 6.1,**

PIL component 2: P.E. lesson plan: This assignment provides students with the opportunity to revise and reflect upon a P.E. lesson taught in the fall to the students in their classroom placements. Students will peer edit the redesigned lesson plans before completing the final assignment paying particular attention to how they would teach this lesson in the future to support students with disabilities. Students who did not teach a P.E. lesson in the fall will create a lesson that utilizes the SCU lesson plan template. Students will have a peer edit their lesson plan before turning in a finalized plan.

Introduce/Practice MMSN TPE 5.2, 5.6; Practice/Assess MMSN TPE 4.2, 4.4, 4.7 **UTPEs: Practice 1.1, 1.4, 1.5, 2.5, 3.1, 3.2, 4.4, 6.6 UTPEs Assess 1.3,1.5, 4.4, 6.1**

Assessments & Grading Criteria

Final grades will reflect your contributions to our community's growth as science teachers, including but not limited to attendance, engagement in class discussions, completion and quality of course assignments, critical and reflective thinking for integrating theory, research and practice.

Attendance and punctuality

- As indicated above, absence and lack of punctuality can immediately affect your final grades. Attendance and participation in all class meetings is required. If you are going to be absent from class, you must email or call me to inform me of your absence. You will still be responsible for any missed content.
- Refer to 'Professional Conduct and Performance Policies' below.

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 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

Professional Conduct and Performance Policies
If I have reason to feel you are not meeting all the expectations spelled out below, I will contact you privately to discuss the issue, to clarify the expectations as needed, and to offer my support in helping you reach those expectations. If I do not contact you with a concern, you can assume you are satisfying these requirements. However, if 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 share my assessment with you.

Regular attendance at all class meetings is a requirement in this program. Ten points will be deducted from your final grade for the course for each class session you missed. Each of you will be granted one Emergency Release (ER) per course. Your ER excuses you from one class session with half the grade penalty (loss of 5 points instead of 10). 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.

Students will not be penalized for absences 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. All other absences are unexcused and will affect your grade.

Punctuality. Coming to class (and returning from breaks) on time is another course requirement. Your first lateness will be excused; your second lateness will cause 1 point to be deducted from your final course grade; your third lateness will cause an additional 4 points to be deducted. More than three late arrivals indicate a serious problem; this situation will be dealt with at the instructor's discretion. Attendance and punctuality are the only policies with the immediate potential to impact your course grades. Your instructor through ongoing observation and documentation gathers data documenting your adherence to the remaining policies listed here.

If an instructor has reason to feel you are not meeting all the expectations spelled out below, s/he will contact you privately to discuss the issue, to clarify the expectations as needed, and to offer his/her support in helping you reach those expectations. If your instructor does not contact you with a concern, you can assume you are satisfying these requirements. However, if you would like specific feedback on your professional conduct during the quarter, you are welcome to contact your instructor at any time and s/he will be glad to share his/her assessment with you.

As we will read about 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, group work and pair group is essential for the success of this course. While a class is in session, you should not engage in any activity not directly related to what is taking place in the classroom. Instructors reserve the right to ask you to close your laptop or put away some other form of technology at their discretion; when/if this occurs, please respond quickly and without protest to avoid further disruption of the class's learning. Instructors also reserve the right to ignore your inappropriate use of technology in class and simply deduct points from your final grade. If you would like more detailed clarification about the expectations regarding appropriate and inappropriate in-class technology use, please feel free to contact your instructor for further information.

Note: Points lost due to poor attendance and/or lack of punctuality will be deducted from your final grade. A student with excellent grades on assignments and other aspects of professional conduct can earn a poor course grade as a result of excessive absence or chronic lateness.

Canvas/Camino Course Management System

To access course materials and participate in On-line activities, please be sure to review Canvas (also known as 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 Canvas.

Disability Accommodations Procedure

If you have a disability for which accommodations may be required in this class, please contact Disabilities Resources, Benson 216, http://www.scu.edu/disabilities as soon as possible to discuss your needs and register for accommodations with the University. If you have already arranged accommodations through Disabilities Resources, please discuss them with me during my office hours. 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 Disabilities Resources. The Disabilities Resources office 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). Disabilities Resources must be contacted in advance to schedule proctored examinations or to arrange other accommodations. The Disabilities Resources office would be grateful for advance notice of at least two weeks. For more information, you may contact Disabilities Resources at 408-554-4109.

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 Disability Resources.

Discrimination and Sexual Misconduct (Title IX)

Santa Clara University upholds a zero-tolerance policy for discrimination, harassment and sexual misconduct. If you (or someone you know) have experienced discrimination or harassment, including sexual assault, domestic/dating violence, or stalking, I encourage you to tell someone promptly. For more information, please consult the University's Gender-Based Discrimination and Sexual Misconduct Policy at http://bit.ly/2ce1hBb or contact the University's EEO and Title IX Coordinator, Belinda Guthrie, at 408-554-3043, bguthrie@scu.edu. Reports may be submitted online through https://www.scu.edu/osl/report/ or anonymously through Ethicspoint https://www.scu.edu/hr/quick-links/ethicspoint/

Academic Integrity

The University is committed to academic excellence and integrity. Students are expected to do their own work and to cite any sources they use. A student who is guilty of dishonest acts in an examination, paper, or other required work for a course, or who assists others in such acts, will receive a grade of F for the course. In addition, a student guilty of dishonest acts will be immediately dismissed 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 action (ECP Graduate Bulletin, 2013-2014).

Readings and resources

While there is no required textbook for this course, you are expected to have access to our course website on Camino in order to obtain specific readings, weekly PowerPoint slides, and other resources.
Introduce/Practice MMSN TPE 1.1, 1.4, 1.7, 4.1, 5.1, 5.2, 5.6 **UTPEs Introduce 3.1,**

Download and/or access electronically:

- Current California Science Standards (K-12) (1998)-- http://www.cde.ca.gov/be/st/ss/documents/sciencestnd.pdf
- National Science Teachers Association-- http://www.nsta.org/
- Next Generation Science Standards— http://www.nextgenscience.org/next-generation-science-standards
- Next Generation Science Standards (NGSS) for California Public Schools (adopted 9/4/13)-- http://www.cde.ca.gov/pd/ca/sc/ngssstandards.asp
- NGSS Information for California Science Teachers--http://www.cascience.org/csta/ngss.asp
- English Language Development (ELD) Standards for California Public Schools-- http://www.cde.ca.gov/sp/el/er/eldstandards.asp
- Current California Content Standards for Health Education(K-12) (2008)-- http://www.cde.ca.gov/be/st/ss/documents/healthstandmar08.pdf
- Current California Content Standards for Physical Education (K-12) (2005)-- http://www.cde.ca.gov/be/st/ss/documents/pestandards.pdf

Note: Supplemental readings may be added during the quarter in response to students' interests and/or needs; these readings will either be made available on our Course Website or distributed in class.

Recommended Course Materials

Abruscato, J., & DeRosa, D.A. (2010). *Teaching children science: A discovery approach.* (7th ed.). Boston, MA: Pearson Education.

Bybee, R.W. (2015). *The BSCS 5E instructional model: Creating teachable moments.* Arlington, VA: NSTA Press.

Bybee, R.W. (2013). *Translating the NGSS for classroom instruction.* Arlington, VA: NSTA Press.

Burgstahler, (2012) Working Together: Science Teachers and Students with Disabilities

Bang, M., Warren, B., Rosebery, A. S., & Medin, D. (2012). Desettling expectations in science education. *Human Development*, *55*(5-6), 302-318.

Calabrese Barton, A., Kim, W., & Tan, E. (2020). Co-Designing for Rightful Presence in Informal Science Learning Environments. *Asia-Pacific Science Education*, *6*(2), 285-318. https://doi.org/10.1163/23641177-BJA10015

Kim, W. (2019). Teacher as change agent for consequential learning: One Korean teacher's autoethnography on the dance-with-science project, *Forum for International Research in Education, 5*(2), 79-96. https://doi.org/10.32865/fire201952156

Krajcik, J.S., & Czerniak, C.M. (2014). *Teaching science in elementary and middle school: A project-based approach* (4th ed.). New York, NY: Routledge.

Michaels, S., Shouse, A., & Schweingruber, H. (2007). *Ready, set, science! Putting research to work in K-8 science classrooms.* Washington, DC: National Academies Press.

Larmer, J., Ross, D., Mergendoller, J.R., & Buck Institute for Education (2009). *PBL starter kit: To-the-point advice, tools, and tips for your first project.* Novato, CA: Buck Institute for Education.

National Research Council (NRC). (2012). *A framework for K-12 science education: Practices, crosscutting*

concepts, and core ideas. Washington, DC: National Academies Press.
NOTE: You can download this publication for free at:

http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts

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.
NOTE: You can download this publication for free at:
http://www.nap.edu/catalog/21836/science-teachers-learning-enhancing-opportunities-creating-supportive-contexts

The Common Core State Standards for English Language Arts & Literacy in History/Social Studies, Science, & Technical Subjects: http://www.corestandards.org/read-the-standards/ **UTPEs** Introduce 3.1,

Major reference websites **UTPEs** Introduce 3.1,

Next Generation Science Standards

2016 California Science Framework

Teaching Tools for (STEM) Education

California Department of Education website, specialized programs

Seven case studies of diverse groups

Social Justice Mathematics and Science Curricular Resources for K-12 Teachers

Universal Design Framework

Working Together: Science Teachers and Students with Disabilities

Family Involvement in the Ed Dev. Of Youth with Disabilities

Course Schedule (subject to change)

Course Meeting	Course Topics	Course Readings	Course Assignments
Week 1 April 9th	Course Overview Visions of Science Teaching NGSS 101 Introduction to Science Notebooks Air Investigation Interview with Master Teacher *Signature Assignment – 5E Science Lesson Plan* Introduce MMSN TPE 1.1, 1.2, 4.1 UTPEs Practice 3.4	Ready Set Science Chapter 1 – A New Vision of Science Education	Introductory Survey Science Well Remembered Event (WRE)
Week 2 April 16th	*Online Class NGSS – A Deeper Examination 5E framework of Science Teaching Engage, Experience/Explore, Explain, Elaborate, and Evaluate with Evidence Teaching Science to Students with Disabilities UTPEs Practice 3.2, Practice/Assess MMSN TPE 1.2, 2.1, UTPEs Practice 2.2,	NGSS Videos Vincent, Cassel, & Milligan (2008) Will it Float? (A 5E Lesson) 5E Videos Kahn et al. (2017). A Tale of Two Courses: Exploring Teacher Candidates' Translation of Science & Special Education Methods Instruction into Inclusive Science Practices Introduce MMSN TPE 1.1, 1.2, 4.1 • Exploring NSTA Resources for Students with Cognitive Disabilities • Burgstahler, (2012) Working Together: Science Teachers and Students with Disabilities UTPEs Practice 1.4, 3.2,	Due April 15th at 11:00 pm Science Well-Remembered Event (WRE)

Week 3 April 23rd	**Discussion of WREs** **Introduce Science Talk Activity** **CCSS-ELA for Science & Technical Subjects** **Science Lesson Work Time** **Life Science Lesson**	**Campbell et al. (2016) What We Call Misconceptions May Be Necessary Stepping Stones Towards Making Sense of the World** **Rosebery & Ballenger (2008) Creating a Foundation Through Student Conversation**	**Due April 22nd at 11:00 pm** **NGSS Video Discussion Post Reflection of 5E Readings and Videos** **Bring to class a hard copy or electronic copy of your WRE**
Week 4 April 30th	**Discussion of Master Teacher Interviews** **Funds of Knowledge in Science** **Engaging with Students' Ideas** **Physical Education Standards for CA Schools** **Science Lesson Work Time** **Practice/Assess MMSN TPE 1.2, 2.1,2.8, 2.9, 2.10, 3.1, 3.2 UTPEs Practice 1.1, 3.4** **UTPEs Introduce 3.1,**	**Ready Set Science Chapter 3, Foundational Knowledge & Conceptual Change** **Everett & Moyer (2009) Literacy in the Learning Cycle**	**Due April 29th at 11:00 pm** **Master Teacher Interview** **Bring to class a hard copy or electronic copy of your MT interview**
Week 5 May 7th	**Funds of Knowledge in Science** **Families and Science Learning** **Experience with Data Collection** **Sense-making with Science Data** **PE Lesson Work Time** **Group 1 Science Lesson** **Introduce/Practice MMSN TPE 1.1, 1.4, 1.7 UTPEs Practice 1.1, 4.3**	**Ready Set Science Chapter 5, Making Thinking Visible: Talk and Argument** **Pang (2014) Culture Matters** • **NSTA (2009) Parents of Children with Disabilities Involvement in Science Learning** • **Parent engagement of students with disabilities (Engaging Parents of Students with Special Needs)** **Practice/Assess MMSN TPE 1.2, 2.1,2.8, 2.9, 2.10 UTPEs Practice 1.4, 2.5, 4.4, 6.5**	**Due May 6th at 11:00 pm** **Science Talk Write Up** **Bring to class a hard copy/electronic copy of your Science Talk Write Up**

Week 6 May 14th	**Explaining with Claims and Evidence Safety During Laboratory Practices Managing the Inquiry-based Classroom PE Lesson Work Time Health Education Inquiry Group 2 Science Lesson UTPEs Practice 4.7,**	**Miller et al. (2014) NGSS for English Language Learners Jackson et al. (2016) Claims & Evidence Inquiry in Science & in Classrooms**	**First Science Notebook Check**
Week 7 May 21st	**Developing Collaboration in the Science Classroom for ALL Students Including Students with Disabilities Project-Based Instruction Integration with Science Education Group 3 Science Lesson Practice/Assess MMSN TPE 1.2, 2.1, 2.4, 2.8, 2.9, 2.10,UTPEs: Practice 1.1, 1.4, 2.5,4.4,**	**Colley (2008) Project Based Science Instruction Scaffolding students with Disabilities One of seven case studies of diverse groups https://www.nextgenscience.org/appendix-d-case-studies Practice/Assess MMSN TPE 4.2, 4.4, 4.7 UTPEs: Practice 1.1, 1.4, 2.5, 4.4**	
Week 8 May 28th	**Science Field Trip Exploration**	**Leary (1996) Field Trip Tips**	**Due June 3rd at 11:00 pm PE Lesson Plan Bring a hard copy or electronic copy to share in class**

Week 9 June 4th	**Teaching with Science Trade Books** **Science Fairs and Competitions** **Science for All Students** **P.E. Lesson Discussions** **Group 4 Science Lesson** **Practice/Assess MMSN TPE 1.2, 2.1, 2.4, 2.8, 2.9, 2.10**	**Robertson (2007) What Makes for a Good Science Fair Project** **Kahn et al. (2014) Let's Get Physical: Making Science Accessible for Students with Physical Disabilities** **Practice/Assess MMSN TPE 4.2, 4.4, 4.7 UTPEs Introduce 3.2, UTPEs Practice 1.4, 2.5, 4.4**	**Due June 9th at 11:00 pm** **Health Education Inquiry** **Bring a hard copy or electronic copy to share in class**
Week 10 June 11th	**Assessing Student Progress in Inquiry-Based and PBI Science Classrooms** **Using Technology to Support Scientific Investigations** **Group 5 Science Lesson** **UTPEs Assess 1.3, 4.4**	**Creghan & Creghan (2013) Assessing for Achievement** **Kruse & Wilcox (2017) Building Technological Literacy with Philosophy and Nature of Technology**	**Due Friday June 13th Science Field Trip Plan** **Signature Science Lesson Plan;** **Science Notebook**

Assignment Excerpts with MMSN additions:

Assignment modified 1. Noticing students' presence in science classrooms

1. modified assignment components:

1) my science story: instructional prompts modified for MMSN purpose are as follows.

- report your science knowledge and practices deepened and expanded (as to model how you hope your students engage with science in their daily lives, and
- report your science pedagogical knowledge, which means your knowledge as science teachers about varying ways students would understand and explain scientific phenomena, paying attention to the scientific understanding and explanations of ELL students and students with identified/unidentified special needs.

Introduce/Practice MMSN TPE 1.1, 4.1

2) well-remembered events: instructional prompts modified for MMSN purpose are as follows.

- descriptions of events (three events at minimum),
- accounts of why the events were memorable,
- connections of the events to the literature and resources from this course (and other courses, if any),
- discussions of what impact the events might have on your identity work as a science/P.E. teacher In this report, pay particular attention to:
- how various aspects of your background (e.g., linguistic, cultural, racial, socio-economic, parental involvement, and/or identified disabilities) may have impacted your identification of these events as well-remembered,
- discuss instances in which special needs students' learning can be at stake in elementary science/P.E. classrooms and how such instances can be addressed.

Practice/Assess MMSN TPE 1.2, 4.2, 5.1, 5.2, 5.6

2. Rubric applied to assessing the assignment

My science story Introduce/Practice MMSN TPE 1.1, 4.1 **UTPEs Assess 1.3, 4.4, 6.1**	reports 10 science stories that entails: 1) how the stories were shaped in the context of your personal life, 2) how the stories can differ from those of your students, particularly students with different learning goals and needs (including identified disability and IEP goals, focus of 504 plan or Multi-Tiered System of Supports [MTSS]). **15pts**	reports 7-9 science stories that entails: 1) how the stories were shaped in the context of your personal life, 2) how the stories can differ from those of your students, particularly students with different learning goals and needs (including identified disability and IEP goals, focus of 504 plan or Multi-Tiered System of Supports [MTSS]), Or report 10 science stories that entails two of 1), 2), and 3). **12pts**	reports 4-6 science stories that entails: 1) how the stories were shaped in the context of your personal life, 2) how the stories can differ from those of your students, particularly students with different learning goals and needs (including identified disability and IEP goals, focus of 504 plan or Multi- Tiered System of Supports [MTSS]), Or report 7-9 science stories that entails two of 1), 2), and 3). **9 pts**	reports 1-3 science stories that entails: 1) how the stories were shaped in the context of your personal life, 2) how the stories can differ from those of your students, particularly students with different learning goals and needs (including identified disability and IEP goals, focus of 504 plan or Multi-Tiered System of Supports [MTSS]), Or report 4-6 science stories that entails two of 1), 2), and 3). **5pts**
Well-remembered events Practice/Assess MMSN TPE 1.2, 4.2, 5.1, 5.2, 5.6 **UTPEs Assess 1.3, 6.1**	identifies 3 and more well-remembered events, which entail 1) detailed reasoning and reflections of the moments 2) connection to literature, 3) plans for applying learning from the events into future classroom teaching **15 pts**	identifies 2 well-remembered events, which entail 1) detailed reasoning and reflections of the moments 2) connection to literature, 3) plans for applying learning from the events into future classroom teaching, or identify 3 events that entail two of 1), 2), and 3). **12 pts**	identifies 1 well-remembered events, which entail 1) detailed reasoning and reflections of the moments 2) connection to literature, 3) plans for applying learning from the events into future classroom teaching, or identify 2 events that entail 1 or 2 of 1), 2), and 3).**9 pts**	is lacking accounts of well-remembered events **5 pts**

Exploring pedagogical moves

This assignment focuses on exploring, implementing, and reflecting on pedagogical moves/strategies you can integrate into your science teaching. You may share other pedagogical moves and strategies you/your master teacher

have used effectively. This assignment entails two components: master teacher interview, health education inquiry, and pedagogical moves presentation. Additional details about this assignment will be discussed in class and posted on Camino.

1. modified assignment components:

1) master teacher interview: instructional prompts modified for MMSN purpose are as follows.

- develop question prompts you will use in the master teacher interview. Some example questions are,
  - how does the teacher think about and work on science teaching?
  - what are the biggest challenges in teaching science in the teacher's classroom(s) at the given school environment?
  - how has the teacher established a culture of intellectual respect?
  - does the physical layout allow all students to participate equitably in science?
  - how has the teacher supported students with identified disabilities?
  - what materials for learning science are available in your MT's classroom and/or school? how does the physical and material space allow equitable learning opportunities for ELL students and students with different learning goals and needs?
- conducting interview with MT teacher,
- reflecting on the interview and clearly stating how you will create your future classrooms drawing on your learning from the interview.

Introduce/Practice MMSN TPE 1.7; Practice/Assess MMSN TPE 1.2, 2.1

2) pedagogical moves presentation: instructional prompts modified for MMSN purpose are as follows.

- choose specific content areas you wish to better understand and instruct,
- identify and develop pedagogical moves that can help effectively instruct the content areas,
- identify modifications and supports for ELs and students with identified disabilities that <u>do not lower</u> the cognitive demand of the science, health, or PE task.
- suggest ways to leverage those needs for adaptations as learning opportunities for general students in your science classrooms.
- implement a set of pedagogical moves/strategies in class
- if any, share instructional strategy you/your master teacher have used effectively.

Practice/Assess MMSN TPE 2.8, 2.9, 2.10

3) health education inquiry: instructional prompts modified for MMSN purpose are as follows.

- investigate a health issue or concern that pertains to K-6 students.
- design a lesson module to accommodate all students' needs including students with disabilities.
- present the inquiry to the class and reflect upon how this assignment informs their teaching of health education.

Practice/Assess MMSN TPE 3.1, 3.2

Planning and implementing your lesson

1. modified assignment components:

1) science lesson plan: instructional prompts modified for MMSN purpose are as follows.

- determine where the proposed lesson falls within the science curriculum for the chosen/assigned grade level;

- state learning objectives and associated assessment plans to support students' academic and language learning;
- develop student activities and associated learning materials by analyzing demographic information of your students, and knowledge/expertise they bring to the classroom;
- identify appropriate adaptations to be made in this lesson to meet the needs of English Language Learners and students with identified and unidentified special needs;
- [after demonstration of your lesson plan] reflect on how your lesson can provide students with disabilities equitable access to the content and experiences aligned with the state-adopted core curriculum, particularly students with head injuries through memory processing tasks that support retaining of information.

Introduce/Practice MMSN TPE 1.1, 1.4, 5.1; Practice/Assess MMSN TPE 1.2, 2.1, 2.4, 2.8, 2.9, 2.10, 5.1 **UTPEs** Practice 3.1, **UTPEs** Assess1.3,

2) P.E. lesson plan: instructional prompts modified for MMSN purpose are as follows.

- create a lesson that utilizes the SCU lesson plan template.
- peer edit the redesigned lesson plans before completing the final assignment paying particular attention to how they would teach this lesson in the future to support students with disabilities.
- develop student activities and associated learning materials by analyzing demographic information of your students, and knowledge/expertise they bring to the classroom;

Introduce/Practice MMSN TPE 5.2, 5.6; Practice/Assess MMSN TPE 4.2, 4.4, 4.7

2. Area of change in a comprehensive rubric (applied to each lesson plan)

Component and Standard	Exceeds Standards	Meets Standards	Approaches Standards	Does not Meet Standards
Introduction Introduce /Practice MMSN TPE 1.1, 1.4, 5.1, 5.2, 5.6 **UTPEs Access 1.3, 1.5, 4.4, 6.1**	describes clearly and precisely the following aspects: 1) how the lesson is connected to 5-E model and NGSS-informed science knowledge and practices (for P.E., connected to California Physical Education Framework); 2) whether and how the connection offers a rationale in choosing students' activities and assessment plans; 3) how assessment will be adapted for and center on ELL students and students with health/mental care needs. 12pts	describes two of 1), 2), and 3) clearly and precisely. 9pts	generally describes each of three aspects without showing specific plans. 6pts	is lacking details. Assessment plans are not clear about how they can ensure fair evaluation for students with different learning goals and needs. 3pts
Student activities Practice/ Assess MMSN TPE 1.2, 2.1, 2.4 **UTPEs Access 1.3, 4.4**	describes students' activities and rationales of how the activities can meet learning objectives by providing evidence of the following aspects: 1) how the activities are connected to NGSS and ELD learning objectives (for P.E., connected to California Physical Education Framework), 2) instructional prompts and materials to facilitate students' activities and assessments; and 3) instructional prompts and materials for students with different learning goals and needs (including Els and students with identified disabilities) 10pts	describes two of 1), 2), and 3) clearly and precisely. 7.5pts	generally describes each of three aspects without showing specified evidence. 5pts	is lacking details. Evidence for adaptation is unclear about how to ensure equitable learning opportunities for students with different learning goals and needs. 2.5pts

Reflective and equitable assessment for students' growth Practice/ Assess MMSN TPE 2.8, 2.9, 4.2, 4.4, 4.7 **UTPEs Access 1.3, 1.5, 4.4, 6.1**	describes assessment plans and rationales of how the plan assesses both growth of students' learning and effectiveness of your teaching approach, by providing evidence of the following aspects: 1) how the assessments reflect learning objectives of the lesson by connecting the assessment items to NGSS and ELD learning objectives (for P.E., connected to California Physical Education Framework), 2) how the assessment content and format you presented are student-friendly, related to their daily lives and classroom activities they engaged in, promoting high-order thinking; and 3) how the assessment content and format you presented are respectfully adapted to different learning goals,needs, and activities of students (including Els and students with identified disabilities) 10pts	describes two of 1), 2), and 3) clearly and precisely. 7.5pts	generally describes each of three aspects without showing specified evidence. 5pts	is lacking details. Evidence for adaptation is unclear about how to ensure equitable learning opportunities for students with different learning goals and needs. 2.5pts
Reflections on areas of improvements and adaptations Practice/ Assess MMSN TPE 2.1, 2.4, 2.8, 4.2, 4.4, 4.7 **UTPEs Access 1.3, 4.4,**	identifies specific areas of improvements and provide detailed plans of what changes can be made to improve each of the identified areas. Clearly identifies specific adaptations to better serve EL students and students with identified disabilities. 8pts	identifies specific areas of improvements and provide detailed plans of what changes can be made to improve some of the areas. identifies some plans of adaptations to better serve EL students and students with identified disabilities. 6pts	identifies areas of improvements without entailing specific strategies to improve the areas. 4pts	is lacking details. Reflections are unclear about how to improve the lesson implemented so as to serve the learning opportunities for students with different learning goals and needs 2pts

6.1				