California State University
SAN MARCOS
SCHOOL OF EDUCATION

Engaging diverse communities through leading and learning for social justice.

333 South Twin Oaks Valley Road, University Hall 468
San Marcos, California 92096-0001
760.750.4300
www.csusm.edu/education

Course Number	**EDSS 545A**
Course Title	**Secondary Science Methods**
CRN Number	**40307**
Days	**Thursdays**
Time	**5 – 8 PM**
Course Location	**Virtual**
Semester / Year	**Fall 2020**
Instructor	**Sean Nank, PhD**
Phone	**760-458-3178**
E-Mail	**snank@cougars.csusm.edu**
Office	
Hours	**By appointment**

SCHOOL OF EDUCATION MISSION & VISION STATEMENT

(Adopted by SOE Governance Community, January 2013)

Vision

To serve the educational needs of local, regional, and global communities, the School of Education advances innovative practice and leadership by generating, embracing, and promoting equitable and creative solutions.

Mission

The mission of the School of Education community is to collaboratively transform education. We:

- Create community through partnerships
- Promote and foster social justice and educational equity
- Advance innovative, student-centered practices
- Inspire reflective teaching and learning
- Conduct purposeful research
- Serve the School, College, University, and Community

BASIC TENETS OF OUR CONCEPTUAL FRAMEWORK

- Student centered education
- Research and theory specific to the program field inform practice
- Connections and links between coursework and application
- Strong engagement between faculty and candidates
- Co-teaching clinical practice
- Culturally responsive pedagogy and socially just outcomes

TABLE OF CONTENTS

COURSE DESCRIPTION....3
Course Objectives....3
Credit Hour Policy Statement....3
REQUIRED TEXTS, MATERIALS AND ACCOUNTS....3
Course Material Available....4
Cougar Courses....5
PROGRAM STUDENT LEARNING OUTCOMES (PSLOs)....4
GENERAL CONSIDERATIONS....5
School of Education Attendance Policy....5
CSUSM Academic Honesty Policy....6
Plagiarism....6
Students with Disabilities Requiring Reasonable Accommodations....6
All University Writing Requirement....7
Use of Technology....7
Electronic Communication Protocol....7
COURSE REQUIREMENTS AND GRADED COURSE COMPONENTS....7
Grading Standards....9
Policy on Late/Missed Work....9
SCHEDULE/COURSE OUTLINE....21

COURSE DESCRIPTION

This core course is designed to discover what type of teacher you wish to be and what learning goals you will have for your students in your science classrooms. We will become adept at understanding the Next Generation Science Standards (NGSS) and California Framework for Science; creating positive learning environments; aligning our curricula, pedagogy, and classroom management strategies; understanding the balance between procedural, conceptual, and application; and determining our trajectory as science educators to best scale our impact in a positive way for our students, their parents, our colleagues, and the community.

Course Objectives

This course enables teacher candidates to learn about science standards while coherently applying curricular and pedagogical strategies while maintaining stellar classroom management in a non-contradictory and collaborative educational milieu

Teacher candidates will foster:

1) An understanding of the Next Generation Science Standards, California Framework for Science, and effectively use curricula and pedagogy in alignment with the standards.
2) How to understand and solidify your philosophy of science education, what it means to be a scientist, and how to foster a scientific identity in classroom settings.
3) Critically embracing multiple resources for educators and learners in the classroom.
4) Opportunities for students to discover and embrace practical and life applications of science.
5) Implementation of best practices in science education.
6) Integration of curricula, pedagogy, and classroom management in a non-contradictory manner.
7) Student thought which embraces and fosters a perception of thinking and learning like a scientist.
8) Traditional and progressive forms of assessment including a balance between formative and summative assessments coupled with an understanding of multiple grading philosophies (including Standards Based Grading) and grading mindsets (including Grading for Learning).

Credit Hour Policy Statement

In all master course work, it is expected that for every one hour of contact time, you will complete approximately two to three hours of work outside of class. For EDSS 545A, a 2-credit class, expect 3-6 hours of homework each week. Please plan accordingly.

REQUIRED TEXTS, MATERIALS AND ACCOUNTS

Required Texts *Assigned texts and readings must be brought to all class sessions.*

California Department of Education. (2016) California Framework for Science. Retrieved from https://www.cde.ca.gov/ci/sc/cf/cascienceframework2016.asp.

Edsys. 50 innovative teaching methods in science. Retrieved from: https://www.edsys.in/innovative-science-teaching-methods/

Education.com. Science project: Pineapple enzyme. Retrieved from: https://www.education.com/sciencefair/article/pineappleenzyme/#:~:text=Pineapples%20come%20from%20pineapple%20plants,their%20lips%20and%20tongue%20sore.

Home Science Tools. Tips for teaching science to high school (grades 9-12). Retrieved from:

https://learning-center.homesciencetools.com/article/tips-for-teaching-science-to-high-school/

Kliebard, H. (1977). Curriculum theory: Give me a "for instance." Curriculum Inquiry (6, 4). pp. 257-269. Retrieved from: https://talkcurriculum.files.wordpress.com/2014/09/kliebard-h-1977-curriculum-theory-give-me-a-for-instance.pdf

Mader, J. (2016). The exhausting life of a first-year science teacher: What it's like to learn how to teach – while teaching. The Atlantic. Retrieved from: https://www.theatlantic.com/education/archive/2016/04/the-exhausting-life-of-a-first-year-science-teacher/478164/

Nank, S. D. (2011). *The making of a presidential mathematics and science educator. Volume 1.* Chicago, IL: Discovery Association Publishing House.

Nank, S. D. (Interviewee), Vicki Davis (Interviewer). (2018). iPad for masterful math: Randomizing formative math assessment. Episode 228. Retrieved from: http://www.coolcatteacher.com/ipads-masterful-math-randomizing-formative-math-assessment/

Next Generation Science Standards (n.d.) Retrieved from https://www.nextgenscience.org/

Seiler, G. (2011). Reconstructing science curricula through student voice and choice. Education and Urban Society (45, 3). pp. 362-384.

Tachibana, C. (2015). Effective teaching: To be an effective educator, get active. AAAS. Retrieved from: https://www.sciencemag.org/features/2015/09/effective-teaching-be-effective-educator-get-active#

* Students will retrieve several articles for required reading specific to their genre of science and indicative of their classroom strategies and philosophies.

* The required reading section looks long but it is because instead of making you buy 3-4 books on science education, we are using free articles and resources located online.

* You must have access to Excel 2007 for Windows. This is available on campus, if no other access.

Recommended Texts *Selections may be included in electronic readings.*

Lave, J., & Wenger, E. (1991). *Situated Learning: Legitimate peripheral participation*. New York, NY: Cambridge University Press.

Nank, S. D. (Interviewee), Paula Phillips (Interviewer). (2018) The beauty of math. Retrieved from: https://www.voiceamerica.com/episode/104795/the-beauty-of-math

Nank, S. D. (2017). Seven steps for adapting technology to the classroom. Southeast Education Network (SEEN) (19, 1). Retrieved from: http://www.seenmagazine.us/Articles/Article-Detail/ArticleId/6500/Seven-Steps-for-Adapting-Technology-to-the-Classroom

Nank, S. D. (Interviewee), Goode, R. W. (Author). (2017). You need math awareness – here's why: collaboration, decomposing numbers, and pattern recognition are key to developing numeracy skills. Black Enterprise. Retrieved from: http://www.blackenterprise.com/education/you-need-math-awareness-heres-why/

Nank, S. D. (2017). Balancing math education: Interview with Sean Nank, PhD. Kindergarten Kiosk. Retrieved from:
https://www.kindergartenkiosk.com/podcast/4/27/balancing-math-education-interview-with-sean-nank-phd

Nank, S. D. (Interviewee), Will, M. (Author). (2017). Math 'makes the world more beautiful': A professor's advice on teaching
math. Education Week. Retrieved from:
http://blogs.edweek.org/teachers/teaching_now/2017/04/math_teacher_qa.html?cmp=soc-edit-tw

Nank, S. D. (Interviewee), Schaffhauser, D. (Author). (2017). What's out in 2017: 5 ed tech trends on the way out in 2017. THE
Journal: Transforming Education Through Technology (44, 2). pp. 14 – 17. Retrieved from:
https://digital.1105media.com/THEJournal/2017/THE_1703/TJ_1703Q1.html#p=1

Nank, S. D. (Interviewee), Harrington, T. (Author) (2017). Q&A: Tips and insights from a common core math expert. EdSource.
Retrieved from: https://edsource.org/2017/qa-tips-and-insights-from-a-common-core-math-expert/577388

Nank, S. D. (Interviewee), Schaffhauser, D. (Author). (2017). What's hot: 9 major ed tech trends for 2017. THE Journal:
Transforming Education Through Technology. Retrieved from:
https://thejournal.com/articles/2017/01/12/whats-hot-9-major-ed-tech-trends-for-2017.aspx

Wong, Harry K, *The First Days of School*, ISBN 978-0-9764233-1-7, 4th ed; hard copy or e-book; Effective Teaching.com

To stay updated regarding educational issues that impact teaching, learning and leadership, you are urged to read current publications in the field. Some examples include: *Educational Leadership; The Journal of Special Education; Language Arts; Science and Children; Teaching Children Mathematics; Democracy & Education; Phi Delta Kappan; Teaching Tolerance;* and *Rethinking Schools.*

Course Material Available

Cougar Courses

Your assignments, syllabus, supplemental materials, current grades, and folders for turning in assignments are all accessible via your Cougar Courses portal. There will also be videos and links to supplement your activities during the course.

Authorization to Teach English Learners

This credential program has been specifically designed to prepare teachers for the diversity of languages often encountered in California public school classrooms. The authorization to teach English learners is met through the infusion of content and experiences within the credential program, as well as additional coursework. Candidates successfully completing this program receive a credential with authorization to teach English learners.
(Approved by CCTC in SB 2042 Program Standards, August 02)

Course Material Available

Cougar Courses

Your assignments, syllabus, supplemental materials, current grades, and folders for turning in assignments are all accessible via your Cougar Courses portal. There will also be videos and links to supplement your activities during the course.

CREDENTIAL PROGRAM STUDENT LEARNING OUTCOMES (PSLO)

Teacher Candidates will be required to complete a Teaching Performance Assessment, show proof of Teacher Performance Expectations and complete critical assessment tasks- specific assignments for this course. It is the teacher candidates responsibility to understand expectations and complete assignments by stated due dates.

Teacher Performance Expectation (TPE) Competencies

The course objectives, assignments, and assessments have been aligned with the CTC standards for the Single Subject Credential. This course is designed to help teachers seeking a California teaching credential to develop the skills, knowledge, and attitudes necessary to assist schools and district in implementing effective programs for all students. The successful candidate will be able to merge theory and practice in order to realize a comprehensive and extensive educational program for all students. You will be required to formally address the following TPEs in this course:

TPE 8 – Learning About Students

- *Understands child and adolescent development to better understand students*
- *Uses formal and informal methods to learn about students to assess students' prior mastery*
- *Uses interpersonal interactions to learn about students' abilities*
- *Connects with the various factors that can affect student learning and modifies instruction to includes all students*

TPE 11- Social Environment

- *Understands the importance of the social environment*
- *Establishes and maintains a positive environment for learning*
- *Creates classroom community through promotion of students' social competence and natural peer supports*

Teacher Performance Assessment

Beginning July 1, 2008 all California credential candidates must successfully complete a state-approved Teacher Performance Assessment (TPA), as part of the credential program of preparation. During the 2015-16 academic year the CSUSM credential programs will use either the CalTPA (California Teacher Performance Assessment) or the edTPA (Educative Teacher Performance Assessment).

edTPA

Beginning in fall 2015, for newly entering initial candidates, the CSUSM assessment system is the edTPA. To assist with your successful completion of the edTPA, a capstone class is part of your curriculum. In this class edTPA related questions and logistical concerns are addressed. Additional support materials are available on the edTPA website: http://www.edtpa.com/PageView.aspx?f=GEN_Candidates.html

Additionally, to support your success in your credential program and with TPA, SOE classes use common pedagogical language, lesson plans (lesson designs), and unit plans (unit designs).

Expected Dispositions for the Education Profession

Education is a profession that has, at its core, certain dispositional attributes that must be acquired and developed. Teaching and working with learners of all ages requires not only specific content knowledge and pedagogical skills, but positive attitudes about multiple dimensions of the profession. The School of Education has identified six dispositions that must be evident in teacher candidates: social justice and equity, collaboration, critical thinking, professional ethics, reflective teaching and learning, and life-long learning. These dispositions have observable actions that will be assessed throughout the preparation program. For each dispositional element, there are three levels of performance - *unacceptable*, *initial target*, and *advanced target*. The description and rubric for the three levels of performance offer measurable behaviors and examples.

The assessment is designed to provide candidates with ongoing feedback for their growth in professional dispositions and includes a self-assessment by the candidate. The dispositions and rubric are presented, explained and assessed in one or more designated courses in each program as well as in clinical practice. Based upon assessment feedback candidates will compose a reflection that becomes part of the candidate's Teaching Performance Expectation portfolio. Candidates are expected to meet the level of *initial target* during the program.

GENERAL CONSIDERATIONS

School of Education Attendance Policy

SCHOOL OF EDUCATION ATTENDANCE POLICY

Due to the dynamic and interactive nature of courses in the School of Education, all students are expected to attend all classes and participate actively. At a minimum, students must attend more than 80% of class time, or s/he may not receive a passing grade for the course at the discretion of the instructor. *Individual instructors may adopt more stringent attendance requirements*. Should the student have extenuating circumstances, s/he should contact the instructor as soon as possible. *(Adopted by the COE [SoE] Governance Community, December, 1997).*

Course-Specific Participation and Attendance Policy: This course approaches content in a variety of ways. Structured interactions, group processes, oral presentations, guided discussion of readings, and peer review exercises are the norm. Students are expected to have read assigned materials by the date indicated in the syllabus, and should come prepared to discuss readings individually or in variously structured groups. The degree of your engagement in these processes forms the basis for points assigned in the *participation* category.

Due to the fast paced and highly interactive nature of the course, regular attendance and full participation are expected; teaching and learning is difficult (if not impossible) if one is not present for and engaged in the process. Therefore, the above SoE Attendance Policy is amplified as follows:

- Missing more than two class meetings will result in one letter-grade reduction from your final course grade; in other words, -10 points from your total count. A third absence will result in failure of the course, per SoE policy.
- Arriving late or leaving early on two occasions will be considered the equivalent of one absence.
- Up to 5 points may be recovered by a make-up assignment. The instructor will craft an assignment relevant to the missed day. Expect the task to be at minimum equivalent in time commitment to the missed session (3 hours).

Inform the instructor *prior* to an absence. Notification of absence does not warrant an excuse.

This course: Attendance and promptness reflect the professional dispositional behaviors required and expected in the teaching profession. A minimum grade of C+ is required in all credential courses to earn the single subject credential. Absences and late arrivals/early departures will affect the final grade. *Teacher candidates may have one absence with no penalty.* Second absence will result in a decrease of half-letter grade (5%). Third absence will result in a decrease of a letter grade or more, a Statement of Concern and possible failure of class. Second tardy or early departure will receive a warning. Third tardy or early departure will result in a decrease of a half-letter grade (5%) and a Statement of Concern. Statement of Concern will require the candidate to write an action plan to resolve the issue. A total of three Statements of Concern on this and/or other issues combined warrant exit from the program.

CSUSM Academic Honesty Policy

Students will be expected to adhere to standards of academic honesty and integrity, as outlined in the Student Academic Honesty Policy. All assignments must be original work, clear and error-free. All ideas/material that are borrowed from other sources must have appropriate references to the original sources. Any quoted material should give credit to the source and be punctuated accordingly.

Academic Honesty and Integrity: Students are responsible for honest completion and representation of their work. Your course catalog details the ethical standards and penalties for infractions. There will be zero tolerance for infractions. If you believe there has been an infraction by someone in the class, please bring it to the instructor's attention. The instructor reserves the right to discipline any student for academic dishonesty, in accordance with the general rules and regulations of the university. Disciplinary action may include the lowering of grades and/or the assignment of a failing grade for an exam, assignment, or the class as a whole.

Incidents of Academic Dishonesty will be reported to the Dean of Students. Sanctions at the University level may include suspension or expulsion from the University.
Refer to the full Academic Honesty Policy at:
http://www.csusm.edu/policies/active/documents/Academic_Honesty_Policy.html

Plagiarism

As an educator, it is expected that each candidate (course participant) will do his/her own work, and contribute equally to group projects and processes. Plagiarism or cheating is unacceptable under any circumstances. If you are in doubt about whether your work is paraphrased or plagiarized see the Plagiarism Prevention for Students website http://library.csusm.edu/plagiarism/index.html. If there are questions about academic honesty, please consult the University catalog.

Students with Disabilities Requiring Reasonable Accommodations

Students with disabilities who require reasonable accommodations must seek approval for services by providing appropriate and recent documentation to the Office of Disability Support Services (DSS). This office is in Craven Hall 4300, contact by phone at (760) 750-4905, or TTY (760) 750-4909. Students authorized by DSS to receive reasonable accommodations should meet with their instructor during office hours. Alternatively, in order to ensure confidentiality, in a more private setting.

All University Writing Requirement

The writing requirement for this class will be met as described in the assignments. Every course at the university, including this one must have a writing requirement of at least 2500 words.

Use of Technology

Candidates (Course participants) are expected to demonstrate competency in the use of various forms of technology (i.e. word processing, electronic mail, Moodle, use of the Internet, and/or multimedia presentations). Specific requirements for course assignments with regard to technology are at the discretion of the instructor. Keep a digital copy of all assignments for use in your teaching portfolio. All assignments will be submitted online, and some will be submitted in hard copy as well. Details will be given in class.

Electronic Communication Protocol

Electronic correspondence is a part of your professional interactions. If you need to contact the instructor, e-mail is often the easiest way to do so. It is my intention to respond to all received e-mails in a timely manner. Please be reminded that e-mail and on-line discussions are a very specific form of communication, with their own nuances and etiquette. For instance, electronic messages sent in all upper case (or lower case) letters, major typos, or slang, often communicate more than the sender originally intended. With that said, please be mindful of all e-mail and on-line discussion messages you send to your colleagues, to faculty members in the School of Education, or to persons within the greater educational community. All electronic messages should be crafted with professionalism and care.
Things to consider:

- Would I say in person what this electronic message specifically says?
- How could this message be misconstrued?
- Does this message represent my highest self?
- Am I sending this electronic message to avoid a face-to-face conversation?

In addition, if there is ever a concern with an electronic message sent to you, please talk with the author in person in order to correct any confusion.

COURSE REQUIREMENTS AND GRADED COURSE COMPONENTS

Assignments

All assignments are due on the dates indicated. Assignments *must* be submitted via Cougar Courses, double-spaced, and with standard margins, and adhere to style and formatting guidelines of APA 6th ed., as appropriate to the assignment. It is expected that all assignments will reflect graduate-level expectations for composition and exposition. Use of electronic spelling and grammar checking is encouraged. The Writing Center is available for support (Kellogg Library 1103, 760-750-4168).

Grading Standards

Grades will be based on the following grading scale:

The course is writing intensive, and success depends on keeping pace with course writing structures and due dates. As such, work submitted late, but within one week of the due date will be reduced by one letter grade. Work received over one week late will be recorded at half the graded value. *Note:* assignments are due whether or not you are present in class that day.

A	.....	90 – 100%
B	.....	80 – 89%
C	.....	70 – 79%
D	.....	60 – 69%
F	.....	Below 60%

Policy on Late/Missed Work

No credit will be given if you miss an in-class assignment or required presentation. Assignments submitted late will not receive full credit. If extenuating circumstances occur, the teacher candidate should contact the instructor as soon as possible to make appropriate arrangements.

SCHEDULE/COURSE OUTLINE

Date	Topic	Complete assignments BEFORE Class Session/Day
Session 1 **3 Sept** **Synchronous**	**Building a Scientific Learning Community** What are characteristics of an effective science classroom? What is your relationship with science? Understanding you WHY ***Lesson Planning – Warm Up (anticipatory set), Activities, and Cool Downs (closure)***	**Read:** NGSS and California Standards **View:** See Cougar Courses **Do:** Look over the Syllabus and start next week's assignment!! All discussion posts – Original due Sunday eve, responses due Wednesday eve.

Date	Topic	Complete assignments BEFORE Class Session/Day
Session 2 **10 Sept** **Asynchronous**	**Students as young Scientists in a community of learners** What does it mean to "do science"? How do beliefs, attitudes, identities, etc. influence learning? https://talkcurriculum.files.wordpress.com/2014/09/kliebard-h-1977-curriculum-theory-give-me-a-for-instance.pdf	**These are all due by this day, Sept 10th – this is NOT something you start on today, it is something that is finished by today.** **Read:** Kliebard **View:** See Cougar Courses **Do:** Discussion Post - (4 pts)
Session 3 **17 Sept** **Synchronous**	**NGSS and California Standards - What's the Es?** ***Lesson Planning – activities (instruction)***	**Read:** Introduction and one chosen chapter from the Presidential Book **View:** See Cougar Courses **Do:** Discussion Post - (4 pts)
Session 4 **24 Sept** **Asynchronous**	**NGSS and California Standards** ***Lesson Planning – activities (instruction) and cool downs (closure)*** Surviving and thriving in your first years of teaching	**Read:** The exhausting life **View:** See Cougar Courses **Do:** Discussion Post - (4 pts) Turn in your Lesson Plan WARM UP (Anticipatory Set) section (10 pts)
Session 5 **1 Oct** **Synchronous**	**Lesson Planning** *Let's chat about your ACTIVITY portion of your lesson plan due next week*	**Read:** One chosen chapter from the Presidential Book **View:** See Cougar Courses **Do:** Discussion Post - (4 pts)
Session 6 **8 Oct** **Asynchronous**	**Complete the ACTIVITY portion of the lesson plan this week**	**Read:** No reading this week – concentrate on the ACTIVITY **View:** See Cougar Courses **Do:** Turn in your Lesson Plan ACTIVITY section (20 pts)
Session 7 **15 Oct** **Synchronous**	**Student Engagement** Fostering student-centered pedagogy to facilitate social construction of knowledge	**Read:** Tips for teaching science **View:** See Cougar Courses **Do:** Discussion Post - (4 pts) Turn in your Lesson Plan COOL DOWN section (10 pts)

Date	Topic	Complete assignments BEFORE Class Session/Day
Session 8 **22 Oct** **Asynchronous**	**Student Voice and Choice**	**Read:** Reconstructing science curricula **View:** See Cougar Courses **Do:** Discussion Post - (4 pts)
Session 9 **29 Oct** **Synchronous**	**Assessment Strategies & Innovative Teaching Methods**	**Read:** 50 innovative teaching methods **View:** See Cougar Courses **Do:** Discussion Post - (4 pts)
Session 10 **5 Nov** **Asynchronous**	**What is the Scientific Method & Getting to Know Your Students** *The scientific method – Adam Ruins Everything* *So what is it really and what really matters?*	**Read:** Getting to know your students **View:** See Cougar Courses **Do:** Discussion Post - (4 pts) Start writing your assessment that should be aligned to the unit your lesson plan was written from.
Session 11 **12 Nov** **Synchronous**	**Make Science Fun, Implicit Bias, and Assessments**	**Read:** No reads this week, two views!! **View:** See Cougar Courses **Do:** Continue writing your assessment.
Session 12 **19 Nov** **Asynchronous**	**Effective Teaching & Assessments**	**Read:** Effective teaching **View:** See Cougar Courses **Do:** **Discussion:** Assessment peer review due (8 pts)
Session 13 **26 Nov** **Thanksgiving**	*Thanksgiving!!!!*	Read, view, and do as little as possible because you deserve the break!!!
Session 14 **3 Dec** **Synchronous**	**Scientific Connections (Math and science and fruit, oh my!)** The Pineapple Problem	**Read:** Science Project: Pineapple Enzyme **View:** See Cougar Courses **Do:** The Pineapple Experiment
Session 15 **10 Dec** **Asynchronous**	**Finish up your Assessment assignment**	**Read:** Nothing **View:** See Cougar Courses **Do:** **Assessment Design:** Final version (20 pts)
Session 16 **17 Dec** **Finals Week**	*Final Exam (No Final!)*	

Assignment structure:

Discussions:	32 pts
Assessment:	20 pts
Assessment draft (for peer review):	8 pts
Lesson Plan:	40 pts
Total:	100 pts