



The Science Education
Partnership & Assessment Lab
San Francisco State University

Bio/Sci 750: Science Teaching for Scientists

An Introduction to Science Education, Pedagogy, and Partnership

Fall 2024, Fridays, 12 – 1:40 pm
The SEPAL Classroom, Hensill Hall 245

“I’ve learned that people will forget what you said, people will forget what you did, but people will never forget how you made them feel.”
– Maya Angelou

The largest gain in learning productivity in STEM will come from convincing the large majority of STEM faculty that currently teaches by lecturing to use any form of active or collaborative instruction...”
– James Fairweather

Instructors:

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Lucy M. C. Luong, Ph.D.
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Student Hours:

Tuesday, 4 – 5 pm
Friday, 2 – 3 pm
The SEPAL Lab, Hensill Hall 243
Any time by appointment!

Tuesday, 11 am – 12 pm
Thursday, 9 – 10 am
The SEPAL Resource Center, Hensill Hall 236
Any time by appointment!

Course Credit: 2 units, graduate course elective

Course Description: This course is designed to provide an introduction to practical teaching strategies, science education theory and research, and evidence-based and inclusive teaching strategies that can be used in a variety of professional and personal contexts throughout your career. Course sessions will include both instructor-driven and student-driven discussions, activities, and presentations, as well as weekly reflections on ideas that we are exploring.

We are here to support you and your success! ¡Sí, se puede!



You belong in this course! We are excited to learn with each and every one of you, and we are here to support your success. We have no doubt that you will do great things with the ideas you learn in this course because of who you are as a person and the values you bring with you from your culture, family, and life experiences. We invite you to bring your *whole self* into our learning community. Each of you bring cultural assets and personal perspectives that will allow you to make unique contributions in science and make the world a better place. *Please bring your personal perspectives and values to all you do in this course!*

We refer to us collectively as **Team 750** because we are committed to all of us supporting one another and succeeding together. Please be confident that you can come to us and your course colleagues with your questions, concerns, challenges, confusions, victories, and requests for help.

Course Goals and Student Learning Objectives:

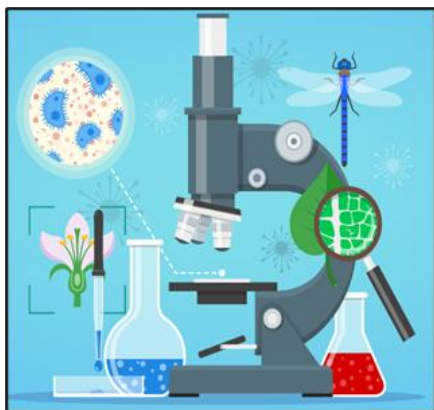
Through the Biol/Sci 750 course, we aspire that we will...

- build a community of scientists who are iteratively improving their knowledge of and skills in teaching the science they know to others.
- explore and evaluate our current use of evidence-based teaching strategies that promote active learning, effective assessment, and equity and inclusion.
- reflect on our current ideas about teaching, develop a Statement of Teaching Philosophy, peer review these statements, and refine our ideas.
- develop a question about what is happening in our teaching contexts, collect evidence to gain insights, analyze that evidence, and share our results with each other through poster presentations.
- record ourselves teaching, review our recordings, and share insights with colleagues about we are proud of and what we might change.
- strategize about how to apply our knowledge of effective science teaching to our scientific careers and professional activities such as research posters, presentations, and lab meetings.
- explore how evidence-based and inclusive teaching can address well-documented, systematic exclusion in science that propagates unfairness.



Course Requirements:

- Attend weekly course sessions on Fridays 12:00 – 1:40 pm!
- Prepare in a scholarly manner for each weekly course session by completing readings, collecting evidence in your teaching context, leading and/or facilitating discussions, and writing reflections.
- Submit a weekly Scientist Reflective Journal entry through Canvas that is more than 300 words and on time, submitted before noon the Thursday before our weekly class meeting so we can read your ideas.
- Schedule a 1-on-1 career advising session with one of the Co-Instructors at some point during the semester.
- Have a Bio/Sci 750 colleague visit, observe, and record one of your teaching sessions or presentations, and do the same for them. Prepare to share excerpts with colleagues.
- Develop and revise a Statement of Teaching Philosophy for future professional use.
- Develop a classroom evidence collection project proposal, implement your plan, and share your data and insights through a scientific poster session.
- Actively participate and be a supportive colleague in all group activities such as class discussions, peer review sessions, and poster sessions.



Canvas: The main location of all our assignments, readings, class agendas, and documents will be canvas.sfsu.edu

Course Components/Grading Scheme: Attendance and class participation are key to getting the most out of the course that you can. If you need accommodations, please reach out to us. All course components are evaluated based on participation. There are no right or wrong approaches – grades reflect effort. The grading scale for the course overall is 93-100% (A), 90-92% (A-), 87-89% (B+), 83-86% (B), 80-82% (B-), 77-79% (C+), 73-76% (C), 70-72% (C-), 67-69% (D+), 63-66% (D), 60-62% (D-), 0-59% (F).

COURSE COMPONENT	% OF GRADE
Reflection	
Weekly Reflections (14 @ 10 points each) • Opportunity to reflect on ideas we're exploring and prepare for class	20%
Participation	
Weekly Attendance & Participation (14 @ 10 points each) • Opportunity to explore scientific teaching strategies in a community of scientists	20%
1-on-1 Career Advising Appointment • Opportunity to get to know the instructors and get support for career goals	10%
Class Projects	
V² Project: Visiting and Videotaping • Opportunity to observe a colleague teaching, as well as one's own teaching	15%
Statement of Teaching Philosophy • Opportunity to develop and refine document for job and other applications	10%
Classroom Evidence Collection Project • Opportunity to apply scientific skills to issues of teaching and learning	15%
Final Semester Reflection • Opportunity to reflect on the course and what we've learned	10%
TOTAL	100%



**PLEASE TAKE
WHAT YOU
LEARN HERE
AND
CHANGE THE
WORLD TO BE
MORE FAIR,
EQUITABLE,
AND
INCLUSIVE!**

Course Topic Sequence and Timeline

(This schedule is approximate and absolutely subject to change!)

August 30	NO CLASS – Enjoy the holiday weekend!
Class #1 September 6	<i>Welcome! Who are we? What does it mean to learn? How do students experience science teaching?</i> <ul style="list-style-type: none">• Keeping Your Eye on the Big Picture: Exploring what it means to learn and exploring scientific teaching• Bio/Sci 750: It's about all scientific contexts, not just teaching
Class #2 September 13	<i>How can we change teaching and education to better serve students? What strategies can we use to promote student success?</i> <ul style="list-style-type: none">• Changing systems: cultural wealth and student asset models• Twenty-one practical equity strategies for the science classroom
Class #3 September 20	<i>How can we promote inclusivity in classrooms? other contexts?</i> <ul style="list-style-type: none">• Instructor Talk: another tool to promote inclusion and learning• Scientist Spotlights: integrating inclusive curricula into class sessions
Class #4 September 27	<i>How can we plan experiences that promote learning? What is it like to implement scientific teaching strategies?</i> <ul style="list-style-type: none">• The 5-E Model: Scientific approaches to lesson planning• Poster session to share about a strategy or strategies you have implemented so far
Class #5 October 4	<i>How can we recognize and address inequities and unfairness in classrooms?</i> <ul style="list-style-type: none">• Defining and thinking about equity in your teaching: Mobiles
Class #6 October 11	<i>How can we retain more students in the sciences? How can we collect evidence about what's going on in our classrooms?</i> <ul style="list-style-type: none">• Revisiting the twenty-one practical equity strategies for the science classroom• Preparing to craft classroom evidence collection proposals
Class #7 October 18	<i>How do we reveal student thinking about complex ideas through assessment? How can student ideas guide our teaching?</i> <ul style="list-style-type: none">• Exploring The Montillation of Traxoline• Lessons from Thin Air: leveraging misconceptions in teaching

Class #8 October 25	<i>How can we incorporate assessment into every class session? How can we write effective questions to gauge student learning?</i> <ul style="list-style-type: none"> • Assessment in 1, 5, 10, and 20 minutes
Class #9 November 1	<i>Wild Card!</i> <ul style="list-style-type: none"> • V² Project – Visiting and Videotaping – Final Week!
Class #10 November 8	<i>How can we improve our classroom evidence collection proposals through peer review?</i> <ul style="list-style-type: none"> • Peer review panels on classroom evidence collection proposals
Class #11 November 15	<i>What did we learn from recording our own teaching?</i> <ul style="list-style-type: none"> • Excerpts of Classroom Recordings – Presentations
Class #12 November 22	<i>What are our new professional goals for continually improving as scientist educators?</i> <ul style="list-style-type: none"> • Peer Review of Statements of Teaching Philosophy
November 29	NO CLASS – Fall Break!
Class #13 December 6	<i>What does collecting evidence in our classroom reveal?</i> <ul style="list-style-type: none"> • Poster Session on Classroom Evidence Collection Project
Class #14 December 13	<i>What have we learned about science teaching? How could this course be improved?</i> <ul style="list-style-type: none"> • Making Bio/Sci 750 Better: Carousel Graffiti

San Francisco State University Policies:



Access for Students with Disabilities:

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. The Disability Programs and Resource Center (DPRC) is available to facilitate the reasonable accommodations process. The DPRC is located in the Student Service Building and can be reached by telephone (voice/TTY 415-338-2472) or by email (dprc@sfsu.edu). (<https://access.sfsu.edu>)

Policy on Observance of Religious Holidays: The faculty of San Francisco State University shall make reasonable accommodations for students to observe religious holidays when such observances require students to be absent from class activities. It is the responsibility of the student to inform the instructor, in writing, about such holidays during the first two weeks of the class each semester. If such holidays occur during the first two weeks of the semester, the student must notify the instructor, in writing, at least three days before the date that he/she will be absent. It is the responsibility of the instructor to make every reasonable effort to honor the student request without penalty, and of the student to make up the work missed. (Academic Senate Policy F00-212)

Statement on plagiarism and cheating: Students are expected to maintain academic integrity in all work pursued at San Francisco State University. Cheating on tests may, at the discretion of the instructor, result in the automatic disqualification of the test and the student receiving zero points for that test. Cell phone use (text messaging included) during a test for *any* reason (personal or otherwise) is considered cheating. Plagiarism, defined as either **1) direct copying or loose paraphrasing of text from a published work or from an online source without appropriate referencing, 2) use of another student's work or ideas without appropriate attribution, or 3) use of AI in writing assignments**, will result in zero points earned for that assignment. The incident will be reported to the Student Judicial Officer to determine whether additional action should be taken.

Student disclosures of sexual violence: SF State fosters a campus free of sexual violence including sexual harassment, domestic violence, dating violence, stalking, and/or any form of sex or gender discrimination. If you disclose a personal experience as an SF State student, the course instructor is required to notify the Title IX Coordinator by completing the report form available at <http://titleix.sfsu.edu>, emailing vpsaem@sfsu.edu or calling 338-2032.

To disclose any such violence confidentially, contact:

The SAFE Place - (415) 694-3825; safeplace@sfsu.edu; <https://dos.sfsu.edu/safeplace>

Counseling and Psychological Services Center - (415) 338-2208; <http://psyservs.sfsu.edu/>

For more information on your rights and available resources: <http://titleix.sfsu.edu>

Food and Housing Insecurity and Support: Students experiencing economic hardships resulting in food insecurity, housing insecurity, or homelessness are encouraged to reach out to us or other faculty and staff members. SFSU has programs and resources in place to provide support with housing, food & other emergencies. Please reach out to us. We are eager to support all of you!
(<https://basicneeds.sfsu.edu>)

Departmental and University Procedures and Deadlines:

Credit/No Credit Option: Students are responsible for choosing this option. The **deadline to request credit/no credit grading is Friday, December 6, 2024**. The option cannot be reversed after the request.

Dropping a Course: The student is responsible for dropping online during registration access hours until the **last day to drop, Monday, September 16, 2024**.

Withdrawal from a Course: After the first two weeks of instruction, withdrawal from a course is not permitted except for serious and compelling reasons. If the withdrawal is approved, the student will receive a "W" grade. Requests for withdrawal are reviewed by the Instructor and Department Chair. Students must submit their unofficial transcripts along with their petitions. **Last day to withdraw is, Monday, November 11, 2024**.

Withdrawal by Exception: Withdrawals **beyond November 12, 2024 to December 13, 2024** are only accepted in cases of verified accident or serious illness where the cause of withdrawal is due to circumstances clearly beyond the student's control and where the assignment of an incomplete is not practical. Ordinarily, withdrawals in this category involve a total withdrawal from the University. All requests during this period must be reviewed by the Instructor, Department Chair, and Associate Dean. Students must submit their unofficial transcripts and appropriate documentations along with their petitions.

