

CAS 409:
Practicum
Teaching
Science Course
Winter 2019



**SCIENCE
LITERACY
PROGRAM**

As part of the Science Literacy Program we will pay special attention to uncovering ways science is connected to larger societal issues and big ideas across and within the discipline. SLP courses include General Education courses for non-science majors and courses for science majors taught by teams of faculty, graduate fellows, and undergraduate scholars, who will include opportunities during class time for you to engage with the class topics through a variety of activities. For more information about the program visit scilit.uoregon.edu

When & where we meet:

Time: W 11 – 11:50 am

Location: WIL 350

Final: M 3/18 10:15-12:15

Practicum Description

In this course, we explore and apply principles of Scientific Teaching

In this practicum, undergraduate science students will explore the concepts and theories behind Scientific Teaching. Students will develop inclusive classroom activities and assessments to support student learning in a science course. Upon completion of this practicum, students may have the opportunity to co-teach a Science Literacy Program course under the direct supervision of a faculty mentor to continue developing and applying teaching skills.

Your Teaching Team

Instructor Name: Elly Vandegrift (she, her, hers)

Please call me "Elly" in all communications

Office Location: 141 Willamette

Instructor Email: ellyvan@uoregon.edu

Instructor Phone Number: 541-346-8982

Instructor Name: Lisa Eytel (she, her, hers)

Office Location: 417 LISB

Instructor Email: leytel@uoregon.edu

Instructor Name: Blake Parris (he, him, his)

Office Location: 40 Willamette

Instructor Email: parris@uoregon.edu

What Are Office Hours?

Office Hours in the Science Library Café

Tuesday 11 am – 12 noon (Blake)

Wednesday 10 am – 11 am (Elly)

Wednesday 12 noon – 1 pm (Lisa)

Each of us is also available by appointment.

We are here to help guide your learning and help you succeed during the course. We are available during office hours to answer questions about this course or provide additional resources. We invite you to come visit us, so we can meet you and learn more about your interests in the course. Office Hours are a great way to make connections with faculty and graduate students, which may be helpful when you need future letters of recommendation or academic advice.

Course Goals

In this course students will

1. Explore ways in which Scientific Teaching principles can be used to enhance a student classroom experience.
2. Understand how the three pillars of Scientific Teaching (active learning, assessment, and inclusivity) can be used in development of a classroom activity.
3. Enjoy the intricacies of creating a well-developed lesson.

Course Learning Objectives

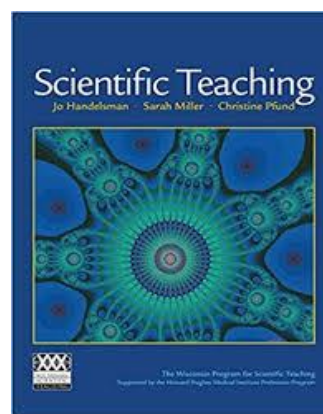
By the end of the course students will be able to:

1. Plan an inclusive microteaching activity through the backward design process by identifying learning goals and objectives and creating assessments and activities to support student learning.
2. Identify and apply inclusive teaching practices to create a classroom environment that supports learning for all students.
3. Explain the theory and evidence behind Scientific Teaching and active learning as techniques that support student learning.
4. Write and discuss reflections of their teaching experience.
5. Provide and apply peer feedback to student-designed lesson plans.

What supplies will you need for this course?

Handelsman, J., Miller, S., & Pfund, C. (2007). *Scientific teaching*. Macmillan

Canvas Access



How will you be graded?

This is a two-credit, pass/no pass course. To pass the course, you must complete at least 70% of all material satisfactorily, submit your microteaching components on time (including the final presentation), *meet* or *exceed* expectations on your presentation, and miss no more than two class meetings.

How you'll know you're learning:

We will spend time in class discussing and practicing evidence-based teaching pedagogy and you will have the opportunity to read more outside of class as you develop a course activity. The more effort you put towards your teaching practice during the term, the easier it will be to incorporate innovative teaching on the job.

Formative Assessments

Attendance & Participation Your presence and participation are necessary to make this course successful for you and for the class community. Personal circumstances may prevent you from attending a class meeting, but keep in mind that each class meeting represents a big portion of the overall course. If you have difficulties getting to class, whatever the reason, ***please let one of us know as soon as reasonably possible (preferably before class)***. We are happy to guide you to making up any missed work and information.

Class Participation This course requires more than sitting as a warm body in class. Please come to class prepared to participate in self-reflection, group work, and class discussions. Participation includes respect for your learning community by being on time, turning off cell phones, and paying attention during class.

Readings You will read *Scientific Teaching* during the term. Additional reading assignments will be posted online in Canvas before each class session and class activities will build off the readings. Pre-class discussion questions are posted on Canvas and are designed to prepare you to fully participate in the class activities.

Activities Throughout the class, you will engage in a variety of in-class activities that double as formative assessments to evaluate your understanding and application of the material from the readings and discussions.

Summative Assessments

Microteaching Presentations This project is designed to provide you with opportunities to practice creating a complete lesson plan designed using scientific teaching for an undergraduate science course. We will build pieces of this summative assessment throughout the term, and you will present the activity to your classmates during the final week of the term.

Final Reflection Papers Reflecting on your teaching experience is a part of the Scientific Teaching process. This final paper is designed to help you reflect on your experiences throughout the term, highlight what worked well for you, and help you see what content can be modified for future teaching opportunities.

Inclusivity

Open inquiry, freedom of expression, and respect for difference are fundamental to a comprehensive and dynamic education. We are committed to upholding these ideals by encouraging the exploration, engagement, and expression of divergent perspectives and diverse identities.

Academic Integrity

All students are expected to complete assignments in a manner consistent with academic integrity as outlined in the UO Student Conduct Code. Students must produce their own work and properly acknowledge and document all sources (ideas, quotations, paraphrases, etc). Students can find more complete information about the University of Oregon's Policy on Academic Dishonesty in the University of Oregon *Student Handbook*.

A few things to help you succeed in this course

1. Attend class every week.
2. Complete the weekly pre-class activities before class.
3. Participate and engage in every class activity.
4. When questions arise, send one of us an email or visit office hours.
5. Approach developing your microteaching presentation with a student audience in mind.
6. Keep track of all your assignments with the course calendar. Transfer everything to your personal calendar throughout the term to prevent surprises.

Campus resources to support your learning

Tutoring and Academic Engagement Center Drop-in math and writing support in addition to tutoring, study skills support, and Class Encore. Located in the 4th Floor Knight Library (541) 346-3226, engage@uoregon.edu

Counseling Center Call anytime to speak with a therapist who can provide support and connect you with resources. Located on the 2nd Floor of the Health Center (541)346-3227

Accessible Education Center Provides supports for support student instructional accommodations. If there are aspects of the instruction or design of this course that result in barriers to your participation, please contact us so together we can strategize how you can get the most out of this course. AEC located on the 1st Floor of Oregon Hall (541) 346-1155, uoac@uoregon.edu

Center for Multicultural Academic Excellence (CMAE) Mission is to promote student retention and persistence for historically underrepresented and underserved populations. We develop and implement programs and services that support retention, academic excellence, and success at the UO and beyond. We reaffirm our commitment to all students, including undocumented and tuition equity students. Located on the 1st Floor of Oregon Hall (541) 346-3479, cmae@uoregon.edu

The UO Access Shuttle is an on-campus ride service provided at no cost to students with conditions that limit mobility. More information and a sign-up form can be found on the parking & transportation department website: <https://parking.uoregon.edu/content/access-shuttle>.

Our Duty to Report

As instructors of this course, we are Student-Directed Employees. As such, **if you disclose sensitive information to us, we will respond to you with respect and kindness. We will listen to you and will be sensitive to your needs and desires. We will not judge you. We will support you.** We will direct students who disclose sexual harassment or sexual violence to resources that can help and **will only report the information shared to the university administration when the student requests that the information be reported.** As Student-Directed Employees, we can offer privacy because we are not required to report certain information to the university. However, we cannot be bound by confidentiality in the same way that a counselor or attorney is. Unless someone is in imminent risk of serious harm or is a minor, we will keep your disclosure private. Please note the differences between confidential and private. For more information on reporting obligations of employees and specific details about confidentiality of information, visit titleix.uoregon.edu

Discrimination and Harassment Resources

Additional help and resources for any student who has experienced sexual assault, relationship violence, sex or gender-based bullying, stalking, and/or sexual harassment are available at safe.uoregon.edu or by calling the UO's 24-hour hotline 541-346-7244 [SAFE] or the non-confidential Title IX Coordinator at 541-346-8136.

Students experiencing any other form of prohibited discrimination or harassment can find information at respect.uoregon.edu or aaeo.uoregon.edu or contact the non-confidential AAEO office at 541-346-3123 or the Dean of Students Office at 541-346-3216.

Course Schedule

Week Date	Topic & Learning Objectives *Students will be able to...	Reading and Assignments Due (tentative)
1 1/9	<p>Who are we? What is Scientific Teaching? What is backward design?</p> <p>*Meet classmates and build a learning community *List and describe the elements of the backward design process and how it relates to an active learning classroom</p>	<p>Read: Course Syllabus Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Pages 13-19. Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Chapter 5, "A framework for constructing a teachable tidbit" (skim this!) Assignment: Complete weekly pre-class discussion questions on Canvas.</p>
2 1/16	<p>What are learning goals and objectives?</p> <p>*Define and describe the terms "Learning Goals" and "Learning Objectives" *Modify pre-written learning goals and objectives to incorporate peer feedback and ensure they reflect best practices in Scientific Teaching *Justify how the learning objectives reflect the learning goals</p>	<p>Read: S.A. Ambrose, M.W. Bridges MW, M. DiPietro, M.C. Lovett and M.K. Norman, <i>How Learning Works: 7 Research-Based Principles for Smart Learning</i>, 2010, Jossey-Bass, San Francisco, "Appendix D-What are learning objectives and how can we use them?" Assignment: Complete weekly pre-class discussion questions on Canvas. Microteaching Project: Complete Microteaching Part I: What will students learn?</p>
3 1/23	<p>What is Bloom's Taxonomy and how does it relate to assessments? How do summative and formative assessments benefit student learning? How do assessments relate to learning goals and objectives?</p> <p>*Compare and contrast summative versus formative assessments and their pros/cons for teachers and students *List the different levels of Bloom's Taxonomy and assign a Bloom's level to a variety of exam questions *Justify the use of at least two different types of assessments in your tidbit and provide an example rubric for each assessment</p>	<p>Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Chapter 3, "Assessment" Read: Lord, T., Baviskar, S. "Moving Students from Information Recitation to Information Understanding: Exploiting Bloom's Taxonomy in Creating Science Questions", <i>J. Coll. Sci. Teach.</i> 2007, 36, 40-44. Assignment: Provide feedback to two peers (anonymously assigned) on Microteaching Part I Assignment: Complete weekly post-class reflection questions and pre-class discussion questions on Canvas.</p>
4 1/30	<p>How do assessments and activities engage and gauge student learning? What are the benefits of designing a lesson through a <i>Scientific Teaching</i> process?</p>	<p>Read: Ebert-May, D., Batzli, J., & Lim, H. "Disciplinary Research Strategies for Assessment of Learning", <i>AIBS Bulletin</i>, 2003, 53, 1221-1228. Assignment: Complete weekly post-class reflection and pre-class discussion questions on Canvas.</p>

<p>4 1/30</p>	<p>*Evaluate a lesson plan's assessments for alignment with learning goals and objectives *Explain how their tidbit assessment(s) will gauge student learning *Defend the benefits of a lesson plan developed with the pillars of <i>Scientific Teaching</i> in mind over a traditional lecture lesson plan</p>	<p>Microteaching Project: Complete Microteaching Part II: Initial Planning. Bring a print-out of your initial planning document to class. Microteaching Project: Select a time to meet with a member of the teaching team to discuss your microteaching project</p>
<p>5 2/6</p>	<p>What is active learning and how does it promote student learning? What activities can we use to assess student learning? *Share prior knowledge, experience, and misconceptions about active learning *Apply active learning principles to an example lesson *Align active learning activities with appropriate assessments and outcomes</p>	<p>Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Chapter 2, "Active Learning." Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Chapter 5, "A framework for constructing a teachable tidbit", Step 3, pp. 95-98. Assignment: Complete weekly post-class reflection and pre-class discussion questions on Canvas. Assignment: Provide feedback to two peers on Microteaching Part II (anonymously assigned) Microteaching Project: Meet with a member of the teaching team to discuss your microteaching project</p>
<p>6 2/13</p>	<p>What are the benefits of designing a course around the pillars of Scientific Teaching? What makes a successful active learning activity? *Use an evidence-based active learning strategy from literature to develop an in-class activity for their microteaching project *Practice the backward design process by aligning activities with assessments and outcomes *Provide peer feedback</p>	<p>Read: One of the papers assigned in Microteaching Part III Assignment: Complete weekly post-class reflection questions on Canvas. Microteaching Project: Complete Microteaching Part III: Evidence-Based Pedagogy Microteaching Project: Meet with a member of the teaching team to discuss your microteaching project</p>
<p>7 2/20</p>	<p>How do prior lived experiences and identities affect student learning? How can we promote an inclusive classroom? What biases and assumptions do we bring to teaching and learning? *Understand that learning is idiosyncratic and culturally mediated and, therefore, unique for every person and different at different times *Be able to identify "diversity" with regard to teaching methods, learning, and students</p>	<p>Read: J. Handelsman, S. Miller and C. Pfund, <i>Scientific Teaching</i>, 2007, Chapter 4, "Diversity" Assignment: Take one of the available implicit bias tests Assignment: Complete weekly post-class reflection and pre-class discussion questions on Canvas. Assignment: Provide feedback to two peers on Microteaching Part III</p>

<p>8 2/27</p>	<p>What is a lesson plan? How do we develop a well-aligned lesson plan and confidently teach it? *Provide feedback on lesson plans to peers through the TAG format</p> <p>*Evaluate the alignment and inclusiveness of a lesson plan *Create a lesson plan through a step-by-step process</p>	<p>Assignment: Complete weekly post-class reflection discussion on Canvas. Microteaching Project: Complete Microteaching Part IV: Lesson Plan Bring two printed copies of your lesson to class</p>
<p>9 3/6</p>	<p>Presentations of microteaching projects</p> <p>*Lead a classroom activity has been developed with Scientific Teaching principles *Provide feedback on classmates' teaching activities</p>	<p>Microteaching Project: Submit your finalized Microteaching Project Part V Microteaching Project: Present your microteaching lesson. Participate as a student and give peer feedback to classmates about their tidbits</p>
<p>10 3/12</p>	<p>Presentations of microteaching projects</p> <p>*Lead a classroom activity has been developed with Scientific Teaching principles *Provide feedback on classmates' teaching activities</p>	<p>Microteaching Project: Submit your finalized Microteaching Project Part V Microteaching Project: Present your microteaching lesson. Participate as a student and give peer feedback to classmates about their tidbits</p>
<p>Finals 3/18</p>	<p>Presentations of microteaching projects Teaching reflection</p> <p>*Lead a classroom activity has been developed with Scientific Teaching principles *Provide feedback on classmates' teaching activities *Reflect on the implementation of Scientific Teaching in future teaching endeavors</p>	<p>Microteaching Project: Submit your finalized Microteaching Project Part V Microteaching Project: Present your microteaching lesson. Participate as a student and give peer feedback to classmates about their tidbits Microteaching Project: Complete Microteaching Part VI: Final Reflection (Due 3/22 by 11 am)</p>