Portland State UNIVERSITY

Bi 410/510: Scientific Teaching

Instructor

Dr. Erin Shortlidge
Office: SB1 522; 503-725-9305
Office hour: Wednesdays @ 3-4pm or by appointment
Email: eshortlidge@pdx.edu.
Please **do not use** the D2L email function to contact me.

Meeting time/place

Mondays 4:30-6:30 pm, SRTC 162

Pre- & co-requisites

Upper division or graduate standing

Required items

Text: ***Scientific Teaching***, Handelsman 2009; ISBN: 9781429201889
National Research Council: ***How People Learn***

Learning Objectives

In this course students will:

- Learn theories and research behind how people learn
- Understand the concept and importance of scientific teaching
- Work collaboratively and respectfully with peers
- Read, evaluate and discuss discipline-based education research (DBER)
- Summarize and critique education research papers (written communication)
- Recognize and practice formative assessment
- Practice and understand metacognition
- Learn about student-centered teaching practices and the evidence that supports them
- Observe classrooms and identify aspects of teaching and learning
- Understand and develop backward/integrated curriculum design
- Practice aligning assessments with learning goals
- Develop and teach a teachable unit
- Communicate science verbally
- Evaluate peers' teaching/curriculum development
- Gain a new/modified approach to teaching and learning

Course Web Pages

I will use the PSU online resource "D2L" for posting quizzes, reading materials, daily notes, announcements, etc. Log in at https://d2l.pdx.edu. **Check D2L regularly!**

Important Dates

January 22 Drop deadline (course not on transcript)

February 26 Withdraw/grading option change deadline

A more detailed academic calendar can be viewed here: https://www.pdx.edu/registration/sites/www.pdx.edu.registration/files/Academic_Calendar_2016-17.pdf

Grading

Activity	Points Possible
Paper reviews (and/or discussion lead - 510 only)	50
Thought and reading quizzes	20
Teaching observations	10
Curriculum development and presentation	50
Teaching philosophy statement	20
	Total = 150

Classroom Participation

Your success in this course is dependent upon working independently as well as with small groups and participating in the larger classroom discussions. All students are expected to participate.

- Discussion in this class will be conducted in adherence to the University nondiscrimination policy.
- We respect diverse points of view. We do not need to come to an agreement on any particular issues: we can agree to disagree.
- Our use of language should be respectful of other persons or groups. (As your instructor, I will not let injurious statements pass without comment.)
- You need not represent any group, only yourself, though you may choose to represent a group if you wish.
- If you feel uncomfortable about any aspect of the class environment, it is your responsibility to discuss it with the instructor.

Online quizzes/activities

Throughout the course there will be 4 online quizzes that are to be taken through D2L. The quizzes must be completed by the announced due date and time to receive full points.

Grading Policy

Grades will be assigned according to the percentage of possible points earned. As a rough guide, the highest cumulative score can be thought of as 100%. If you earn at least 90% of the highest score you will receive an A- or higher; if you earn at least 80% you will receive a B- or higher; if you earn at least 70% of the possible points you will receive a C- or higher; if you earn at least 60% of the possible points you will receive a D- or higher.

PSU's policy on the temporary grade of Incomplete ("I") is strictly adhered to in this course. Please note, you must be passing the course (with a C- or better) in order to be eligible for an "I" grade. See the PSU Bulletin for more information: http://www.pdx.edu/oaa/psu-bulletin.

Disability

If you have a disability and are in need of academic accommodation visit: http://www.pdx.edu/drc/prospective-students. You may also contact the Disability Resource Center (DRC) front desk at 503-725-4150, email them at drc@pdx.edu, or stop by their office at S.M.S.U. 116. **First** register with the DRC, **then** notify Dr. Shortlidge to make appropriate arrangements.

Classroom and University Policies

Academic Honesty

Cheating or plagiarism of any kind will not be tolerated. See the PSU Code of Conduct: http://www.pdx.edu/dos/codeofconduct. If cheating is observed, the grade for the

assignment will be a "0", and cannot be dropped as a lowest score. The student will be reported to University officials as described in the Code (577-031-0142: Procedures for Complaints of Academic Dishonesty).

Academic Courtesy

Respect the rights of fellow students during the class period. Please avoid talking and other distracting behavior, and turn phones off.

When contacting me by email, be sure to include the essentials of polite written communication: a greeting/salutation of some sort, enough background information to make your request or comment easily understood, a sign-off that includes your name as you wish to be addressed, and correct punctuation, spelling, and grammar. **A polite message is much more likely to receive a speedy response.**

Schedule

Students are expected to be present every day in class and arrive for class on time

Facilities

Everyone is expected to help maintain the appearance of the classroom.

Safe Campus Module

Portland State University is committed to creating a safe campus for all students, and as part of this you are required to complete the Safe Campus Module in D2L. Log in to D2L, and under "My Courses," you'll find a sub-tab titled "Ongoing." Under the "Ongoing" sub-tab, you will see a course titled "Creating a Safe Campus." Click on this course and follow the prompts to complete the module.

Emergency Information

PSU 24 hour Campus Safety: emergency 503-725-4404
Non-emergency 503-725-4407

Other PSU Resources

Student Health and Counseling: 503-725-2800, https://www.pdx.edu/shac/
Women's Resource Center: 503-725-5672, http://www.pdx.edu/wrc/
Global Diversity and Inclusion, 503-725-5919, http://www.pdx.edu/diversity/
C.A.R.E Team: http://www.pdx.edu/dos/care-team

Scientific Teaching, Winter 2017 Course Schedule

Date	Scheduled Topics*	Homework*
Jan 9	Introduction, syllabus Icebreakers Introduction to *How People Learn (HPL)* and *Scientific Teaching (ST)*	**Due:** Thoughts Quiz #1 (D2L) **Assigned:** 1) ***ST*:** Ch 1 - Scientific Teaching; Ch 4 - Diversity 2) ***HPL***: Ch 1- Learning, Speculation to Science; Ch 5 -Mind & Brain
Jan 16	**No Class MLK DAY**	**Due:** Reading Quiz #1 **Assigned:** 1) ***ST*:** Ch 2 - Active Learning 2) Paper #1: Miller & Tanner 2015
Jan 23	Discussion/Activity - Paper #1 Student-centered practices Diversity in the classroom	**Due:** Reading Quiz #2 **Assigned:** 1) Paper # 2: Freeman et al. 2014 2) Paper #3: Eddy & Hogan 2014
Jan 30	Discussion - Papers #2 & 3 DBER fields, research	**Due:** Paper Reviews (#2 & #3) **Assigned:** 1) Paper #4: Crowe et al. 2008 2) Paper #5: Maeyer & Talanquer 2010
Feb 6	Discussion - Papers # 3 & 4 Theories of teaching and learning	**Due:** Paper Reviews (#4 & #5) **Assigned:** 1) Paper #6: Smith et al. 2013 2) ***HPL***: Ch 2 – How Experts Differ from Novices
Feb 13	Teaching Philosophies COPUS Activity/Training	**Due:** Thoughts Quiz #2; Teaching observations schedule **Assigned:** 1) Teaching Observations 2) Paper #7: TBD
Feb 20	Discussion - Paper #7 – TBD Teaching Observations Debrief Teachable Units (TUs)	**Due:** Paper Review (#7) **Assigned:** 1) ***ST***: Ch – 3 Assessment; Ch 5 - Teachable Units
Feb 27	TUs - Day 1	Peer evaluations and presentations
Mar 6	TUs – Day 2	Peer evaluations and presentations
Mar 13	TUs – Day 3	Peer evaluations and presentations
***Finals* Mar 20**	**Teaching Philosophy DUE! Upload to the D2L dropbox by Monday, 3/20 @7pm**	

Schedule and homework are subject to change!

Course Points Detail

- **Thoughts and Reading Quizzes (20 total points possible)**: Each quiz will be administered and completed on D2L by the due date for credit. The quizzes will close online an hour before class starts each Monday. The quizzes are intended to promote reading comprehension, to ensure students keep up with the reading, and to encourage metacognition.

- **Paper Reviews (10 points each, 50 points total):**
  410: Five paper reviews **(Paper #s 2, 3, 4, 5, and 7**): These are to be written with appropriate language and grammar, clear sentence structure, and well-articulated ideas. The intended audience is non-expert readers; therefore students will need to minimize jargon and have no expectations that the reader has deep knowledge of the subject. Keep these reviews succinct – no more than one paragraph for each Part (A & B).

  Part A. Summary:

  a) Introduction – what was the question asked/what needed to be addressed/justification for paper?
  b) Methods – how did they address the question, what methods were used?
  c) Conclusion – what did they find, what was the take home?

  * For examples of summary paragraphs see: This Week in *Science* (science.sciencemag.org)

  Part B. Reflect and suggest:

  a) Brief critique – Explain something you might have done differently, or describe an aspect of the study that could use improvement.
  b) Next steps – What would be a good follow-up study/next action from the current paper?

  510: Paper reviews as described above are due on the day we discuss each paper – turned in at the beginning of class unless you are leading the day's discussion. When leading the discussion come prepared to provide a brief overview, develop discussion questions for your group to address, and generally keep the small group conversation going. Graduate students discussion leaders will be responsible for briefly sharing the main points of their group's discussion with the rest of the class. ***Each 510 student will be a discussion leader at least one time.***

- **Teaching Observation (10 points possible)**
  Each student will arrange to observe one class period from a list of possible STEM courses at PSU. You will use a modified rubric developed for objective assessment of what both instructors and students are doing in class. Details will be provided in class.

- **Building a Teachable Unit (50 points possible)**
  This project will tie together the individual learning goals of the course into one holistic outcome. Both your peers and myself will evaluate the developed curriculum. Working in groups of 2-3: Develop a short (~15 minute) teaching module on a relevant topic. The target audience is science majors in introductory courses (200-level). Your topic will be assigned to you based on key concepts in your group's science discipline. You will design the curriculum with a specific learning theory in mind.

  What is the learning goal(s), learning outcome(s) and how will you assess if the goals were met through the activity?

  Use Chapter 5: Framework for Constructing a Teachable Unit from *Scientific Teaching*

- **Teaching Philosophy Statement (20 points possible)**

In lieu of a final exam, you will work on developing a teaching philosophy that takes into consideration what you have learned in this class and previously. We will discuss the purpose of a teaching philosophy in class. There are also online resources to help you to write a teaching philosophy. Details on expectations will be provided.
http://ucat.osu.edu/professional-development/teaching-portfolio/philosophy/
https://cei.umn.edu/support-services/tutorials/writing-teaching-philosophy/teaching-philosophy-samples
http://www.crlt.umich.edu/tstrategies/tstpum