ELTEP 523A/523B- Winter 2018

Ambitious and Equitable Elementary Science Teaching & Learning

University of Washington, Miller Hall

Office Hours: Email instructor or TAs to schedule

Section	*Room/Time*	*Instructor*	*Teaching Assistant*
A	MLR 112, Mondays 8:30-11:20AM	Carolyn Colley cdawson1@uw.edu	Cristina Betancourt betanc17@uw.edu
B	MLR 212, Mondays 8:30-11:20AM	Kat Laxton, Ph.D. katlaxton.consulting@gmail.com	Bridget DuRuz duruzb@uw.edu

COURSE OVERVIEW

Course Description:

Ambitious teaching practices focus on supporting student learning across ethnic, racial, class, and gender categories; fostering deep understanding of ideas and engagement in solving complex problems rather than the typical emphases on activities and procedural talk. This instruction requires attention to students' emerging ideas and steady adjustments to practice based on assessment of students' understanding.

Ambitious teaching practices are uncompromisingly responsive to students' everyday language, knowledge, and lived experiences. In science, ambitious practice "works with students' ideas" and apprentices young learners into the language and thinking of science as a discipline with the goal of supporting students in constructing and revising their explanations for natural phenomena. This requires that teachers support students in formulating questions about phenomena that interest students, building and critiquing theories, collecting, analyzing and interpreting data, evaluating hypotheses through experimentation, observation, measurement, and communicating findings. It also means that teachers must work on recognizing their own and students' worlds, developing relationships to form inclusive learning communities, providing scaffolding for full participation in science language and activities, and critiquing, challenging, and changing the current culture of science. The ultimate goal is to empower students in the process of becoming scientifically literate and to work toward a new vision of participation in science, one that is more inclusive of a broad range of ideas, for future generations. As Delpit suggests, the inclusion of more voices in the dominant-culture discourse can lead to those voices "not only participating in the mainstream, but redirecting its currents" (Delpit, 2001, p. 552).

The aim of the course is to support the development of your professional identity as future ambitious and equitable science teachers and to support students' identity development in science.

Course Objectives:

Through readings, assignments, and participation, we will:

- Examine the culture of science classrooms and cultural connections (and disconnections) these create for students
- Analyze how school science marginalizes some students
- Develop a deeper understanding of who our students are and develop strategies that fold their lived experiences into scientific stories built in classrooms
- Enact strategies to build inclusive scientific learning communities
- Scaffold science learning opportunities in the classroom
- Enact methods for encouraging students to critique, challenge and change the culture science in the classroom and in their own lives

- Analyze classroom talk to create clear visions about what constitutes rigorous and responsive communities of learners
- Articulate what makes science a unique way of knowing the world and how this is similar and different to mathematics and literacy

Course Expectations:

1. **Attend all class sessions.** Make arrangements with your instructor if you must miss a class session. Send an email to your instructor and TA prior to your absence. If you miss 2 or more class session,s you may not be able to receive credit for the course. (Note: There will be make-up assignments provided if you are absent.)

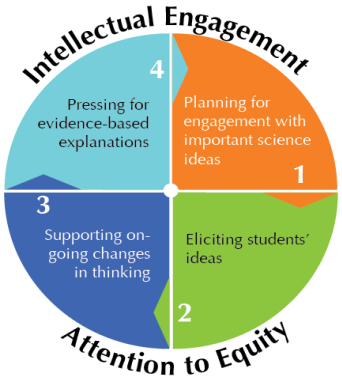
2. **Come to class prepared.** (i.e. read assigned articles, write responses/reflections before class – come with talking points, watch assigned videos, upload/comment on videos, etc.)

3. **Complete assignments on-time**. Assignments need to be completed by the assigned due date. If circumstances arise that make any of these requirements difficult, please discuss your concerns with us *in advance* of the due date.

4. **Be self-reflective and open to feedback**. Doing rehearsals and enactments with your peers and tor watching videos of yourself teaching may feel uncomfortable. We are all taking risks together and all can benefit from feedback (instructors included!). We ask that you are open to feedback from your group facilitators and peers when you plan and try-out moves for the enactments with elementary students.

Conceptual basis for Ambitious Science Teaching Practices:

Based on extensive research of how young people learn science, on authentic forms of science activity, and how teachers learn to appropriate new practices, we describe Ambitious Teaching in terms of a Science Learning Framework with 4 core instructional strategies and tools that support this kind of teaching. More information about these practices can be found at: http://ambitiousscienceteaching.org



In terms of attending to equity we begin by articulating Culturally & Linguistically Responsive principles. Supporting learning for all requires that teachers and students…

- Take interest in how students construct science ideas: see students as sense-makers; see science as tentative and about constructing and revising models; see science teaching as supporting the revision of students' scientific ideas
- Recognize our own and others' cultures and linguistic backgrounds & become a student of the students
- Build relationships and inclusive learning environments with norms for participation in science talk
- Scaffold for full participation in science in formative assessments and in classroom talk
- Broaden our ideas about where science phenomena occur and how they overlap with students' lives
- Engage students and teachers in critique & construction of ideas
- Reflect on HOW students are constructing scientific explanations and help students do the same

WEEK-BY-WEEK COURSE OUTLINE

Session	Date	Assignments Due Prior to the Session	Session Topics
1	Jan 8	**Assignment(s) Due** ● **Write**: Science & You Survey *(Download this survey from Canvas and respond ahead of time. Bring your responses to week 1 and upload them to Canvas.)*	**Class Focus** ● ***Science Experiences****:* How have you experienced science? How do your experiences influence how you perceive science instruction? What does science instruction look like? How do students learn science? ● ***Orientation to Ambitious Science Teaching and Next Generation Science Standards****:* What are the NGSS? and how does it relate to AST Practices? ● ***Review*** expectations, assignments, syllabus

Monday, January 15th is a Holiday.
We will not have a class session. Please attend to the tasks and assignments due Jan 22nd (see below).

2	Jan 22	**Assignment(s) Due** ● **Read:** Planning for Engagement with Important Ideas (Course Pack, p 17) ● **Watch:** Planning for Engagement with Important Science Ideas Video ● **Read**: Your unit guide's Front Matter & Gapless Explanation to the first lesson ● **Write:** Weekly Reflection #1 (Canvas)	**Class Focus** ● ***Modeling & Model-based Inquiry****:* What do we mean by model-based inquiry and how does an Ambitious Science Teaching Unit unfold with models as a central component? ● ***Identifying Big Science Ideas****:* What are the big science ideas for your units of instruction and how are they prioritized during unit planning? Big Ideas Relationship Statement for Unit Focus
3	Jan 29	**Assignment(s) Due** ● **Bring:** Your Big Ideas relationship statement for your unit. *(You worked on this in class on Jan 22. If not completed, finish for HW.)* ● **Read:** A Discourse Primer for Science Teachers (Posted in Canvas) ● **Write:** Weekly Reflection #2 (Canvas)	**Class Focus** ● ***Reflecting on Big Science Ideas*** & the relationship statements for your units. ● ***Importance of Student Talk***: How is talk an essential scaffold to support student learning in science? ● ***Eliciting Students' Ideas****:* How can teachers equitably elicit student science ideas in the beginning of a unit and prioritize them during future instruction?

4	Feb 5	**Assignment(s) Due** ● **Read:** Eliciting students' ideas and adapting instruction (Course Pack, p.42) ● **Write:** Weekly Reflection #3 (Canvas) ● **Bring:** Copy of your mini-unit guide	**Class Focus** ● ***Unit Planning to Adapt Instruction****:* How do teachers prioritize student science ideas and adapt curriculum during a unit? ● ***Scaffolding Student Talk:*** What scaffolding tools support small group and student-to-student talk about their science ideas?
5	Feb 12	**Assignment(s) Due** **Mini-Unit Reflection**: **Lesson 1** ● Upload L1 lesson plan (Canvas) ● Reflection Due (Canvas) ● Upload video + artifacts (Edthena) ● Bring to Class**:** - Class set of student models from L1. - Copy of your mini-unit guide **Supporting Changes in Student Thinking:** ● **Read:** Supporting on-going changes in student thinking (Course Pack, p.68) ● **Read**: How to use direct (or "just-in-time") instruction in your science classroom (Course Pack, p.88) ● **Write:** Weekly Reflection #4 (Canvas)	**Class Focus** ● ***Critical Friends Group:*** Analyze Students' Initial Models using the RSST and student work set from lesson 1 ● ***Supporting Changes in Student Thinking***: - Back-pocket questions: How can student talk opportunities help students learn from activities? - Just-in-time instruction: How to support changes in student thinking over the course of a unit using readings and video? - Processing points: When and how to give students time to process and use new information? - Summary table: Why create public records of activity and learning?
		Monday, February 19th is a Holiday. *We will not have a class session. Please attend to the tasks due Feb 26th.*	
6	Feb 26	**Assignment(s) Due** **Mini-Unit Reflection: Lesson 2** ● Upload L2 lesson plan (Canvas) ● L2 Reflection Due (Canvas) ● Upload video + artifacts (Edthena) ● Bring to class: - 1 set of students' "processing points"; readable photos of your summary table; - Copy of your mini-unit guide **Supporting Changes in Student Thinking:** ● **Read:** Creating Public Records of Science Activity (Course Pack, p.102) ● **Watch**: Supporting Ongoing Changes in Student Thinking (video on website) ● **Write**: Weekly Reflection #5 (Canvas)	**Class Focus** ● ***Critical Friends Group:*** Analyze student learning using Process Points & Summary Chart Data from lesson 2. How many of your students are represented in your summary table, compared to individual processing points? Are you correcting or "teacher-izing" when you summarize? ● ***Formative Assessment: Tracking Student Understanding --*** What do we know about what students learned during an activity? What kinds of questions get more information from students about what they understand? How are you attending to and tracking student's understanding?

7	Mar 5	**Assignment(s) Due** **Mini-Unit Reflection: Lesson 3** ● Upload L3 plan (Canvas) ● L3 Reflection Due (Canvas) ● Upload video + artifacts (Edthena) ● Bring: - 1 set of students' "processing points," photo of summary table; - Copy of your mini-unit guide **Pressing for Evidence-Based Explanations:** ● **Read:** Pressing for evidence-based explanations (Course Pack, p. 109) ● **Watch:** Pressing for evidence-based explanations video (19 mins) ● **Write:** Weekly Reflection #6 (Canvas)	**Class Focus** ● ***Critical Friends Group***: Analyzing student learning using Processing Points & Summary Chart Data from lesson 3. ● ***Pressing for Evidence-based Explanations:*** When asking students to revising their thinking in principled ways, how do we support students in showing what they know? How do we support students in principled revision of their science ideas?
8	Mar 12	**Assignment(s) Due** **Mini-Unit Reflection: Lesson 4** ● Upload L4 lesson plan (Canvas) ● L4 Reflection Due (Canvas) ● Upload video + artifacts (Edthena) ● Collect and bring to class: - 1 set of students' final/revised models **Course Reflection:** ● Final Course Reflection 2-page paper	**Class Focus** ● ***Critical Friends Group:*** Analyzing student learning using final model-based explanations from 4 ● ***Assessing student understanding:*** How to use What-How-Why levels of explanation to assess growth and change of student science ideas over a unit? ● Final Class Reflections & Course Evaluation

** Changes may be made to the schedule and to assignments to reflect questions that arise for the group. Check our canvas course page for the most up-to-date assignment details, homework, readings, rubrics, course handouts, and due dates.*

ADDITIONAL RESOURCES

- NGSS/ NGSS App http://www.nextgenscience.org/next-generation-science-standards
- Science & Children (LB 1585.S34): Practitioners' journal for elementary science teachers.
- Ambitious Science Teaching http://AmbitiousScienceTeaching.org
- National Science Teachers Association http://www.nsta.org/
- WA State Office of Public Instruction http://www.ospi.wednet.edu/
- Facebook: Join about 700 other teachers and coaches thinking about these same Ambitious Science Teaching practices. (Search groups for "Advancing Ambitious Equitable Practices" and ask to join. https://www.facebook.com/groups/140393105993589/)

ASSIGNMENTS

For all assignments, submit responses electronically through Canvas. Use 12-point Times or New Roman Times font, double spaced, unless otherwise specified. (If you do not have easy access to a computer or printer, please use the 4th floor computer lab in Miller.) Details and rubrics for assignments are kept up-to-date on our Canvas site. If you have any questions about assignment expectations, please email us prior to the due date! We are also happy to work with you to talk about science teaching and student learning by arranging an office hours appointment. Here is an overview of the major course assignments:

Weekly Reflections

Most weeks you will have assigned readings and a short reflection that checks for understanding and asks you to apply ideas to your current or future teaching practice. There are 6 of these weekly reflections due during this quarter.

Plan-Enact-Reflect Cycles of Teaching and Learning (Mini-Unit)

This quarter you will team teach a mini-unit series of 4 lessons that includes at least one example of each kind of science teaching practice you will learn about this quarter. You are expected to collect and bring 1 class set of student work samples pertaining to each lesson. (More details will be provided in class for what kind of work samples you need to bring.)

- Lesson 1 purpose: Eliciting Student Ideas; Work samples: 1 class-set of student-created models where students are drawing and writing to explain how and why they think the unit's anchoring phenomena is happening; Reflection paper; Video commentary
- Lessons 2 & 3 purpose: Supporting Changes in Student Thinking; Work samples: 1 class set of "processing points" from your students and photos of your class summary table; Reflection paper; Video commentary
- Lesson 4 purpose: Pressing for Evidence Based Explanations; Work samples: 1 class set of student-created final/revised models; Reflection paper; Video commentary

Final Reflection Paper

Two-page final paper (due on March 12): Explain how your theory of action for science and science instruction has developed throughout the course by reflecting on specific aspects from your "Science & You Self Reflection" (from the beginning of the quarter). Explain how your ideas have changed or evolved based throughout the quarter. The strongest papers will be supported with descriptive examples of classroom interactions that illustrate what supported your learning *and* supported by research (see course readings. Strong papers will *avoid* the use of generic catch-phrases like "student-centered" or "inquiry." There is more information about specifics and grading rubric for this assignment will be available on the Canvas.

WHAT TO EXPECT IN CLASS

Below is a general overview for how we will spend our time together each week; however, this timing may shift based on your feedback and/or unplanned needs that may arise. Come prepared having done assignments required and participate fully. Most class sessions will include dedicated team-time to work with your group in reflecting on prior lessons and co-planning for upcoming teaching enactments for your 4-lesson mini-unit. The order of the following segments may vary week-to-week but generally, this is a timeline you can expect:

25 mins	**Entry Task with homework discussion** (partner, small group, whole group)
5 mins	**Housekeeping** (i.e. assignment clarifications, general questions, logistics)
80 mins	**Today's session focus:** Learning about a specific science teaching practice with a focus on talk, task, and tools; using video examples and/or live demonstrations by instructors (ppt slides and video links in Canvas)
55 mins	**Team planning and rehearsal time** guided by the Team Time checklist,
5 mins	**Class Closing** (includes exit ticket, homework reminders)

GRADING

Each assignment or course component has a certain number of points that contribute to your final grade. Utilize the directions and rubrics available in Canvas for each assignment. Attend to the feedback provided by instructors to understand how to improve or what to include next time. In the event that an assignment needs to be revised and resubmitted, the new grade will be averaged with the original grade for a final grade for that assignment.

Assignment/Component	**%**	**Points**	
Participation in-class	10%	40	(5 points per session x 8 sessions)
Video Upload & Comments (Edthena)	10%	40	(10 points per commentary x 4 lesson videos)
Weekly reflection responses	15%	60	(10 points per weekly reflection x 6 reflections)
Lesson Plan-Enact-Reflect Cycles	50%	200	(4 lesson cycles x 50 points each)
Final Course Reflection Paper	15%	60	(1 final paper due March 12th)
	100% = 400 total points possible		

Final Grades

Exceeds Expectations	*Meets Expectations*	*Approaching Expectations*	*Partially Meets Expectations*	*Below Expectations*
380-400 pts	*350-379 pts*	*300 – 349 pts*	*251-299 pts*	*< or = 250 pts*
4.00 = 97-100%	3.70 = 88-90%	3.40 = 84%	2.90 = 79%	2.50 = 75%
3.90 = 94-96%	3.60 = 86-87%	3.20 = 82%	2.70 = 77%	2.30 = 73%
3.80 = 91-93%	3.50 = 85%	3.00 = 80%	2.60 = 76%	2.10 = 71%

Academic Integrity – Disability Resources for Students – CoE Writing Center

Academic Integrity Policy: The College of Education holds very high standards regarding academic integrity. Work submitted in this course must be the product of your own original effort. When you incorporate the works, words, or ideas of another, you must provide proper citations. If you are concerned about plagiarism, have questions about legitimate forms of collaboration, or are unclear about appropriate methods of citation, consult a style manual or the instructor. Along with plagiarism and unauthorized collaboration, other forms of academic misconduct include (but are not limited to) falsifying attendance records and submitting the work of others as if it were your own. Violations of the Academic Integrity Policy will result in sanctions that can range from disciplinary warning, to probation or suspension, to – in the event of severe or repeated violations – dismissal from the University. For more information please refer to the College of Education's Academic Integrity Policy and related procedures: http://education.uw.edu/my-coe/current-students/academic-policies.

Notice – VeriCite*: The University has a license agreement with VeriCite, an educational tool that helps prevent or identify plagiarism from Internet resources. Your instructor may use the service in this class by requiring that assignments are submitted electronically to be checked by VeriCite. The VeriCite Report will indicate the amount of original text in your work and whether all material that you quoted, paraphrased, summarized, or used from another source is appropriately referenced.

Access and Accommodations: Your experience in this class is important to me. If you have already established accommodations with Disability Resources for Students (DRS), please communicate your approved accommodations to me at your earliest convenience so we can discuss your needs in this course. If you have not yet established services through DRS, but have a temporary health condition or permanent disability that requires accommodations (conditions include but not limited to; mental health, attention-related, learning, vision, hearing, physical or health impacts), you are welcome to contact DRS at 206-543-8924 or uwdrs@uw.edu or disability.uw.edu. DRS offers resources and coordinates reasonable accommodations for students with disabilities and/or temporary health conditions. Reasonable accommodations are established through an interactive process between you, your instructor(s) and DRS. It is the policy and practice of the University of Washington to create inclusive and accessible learning environments consistent with federal and state law.

College of Education Writing Support: The College of Education partners with the Odegaard Writing & Research Center to provide writing support for CoE students. Conveniently located in Miller Hall 407C, this satellite site provides one-to-one tutoring, and our tutors work with writers at any stage of writing, including outlining, drafting, research, and revision. The CoE branch is staffed with undergraduate and graduate peer tutors who are familiar with the College of Education and who can support writers' ideas and projects throughout their writing process. For more information or to schedule an appointment, please visit our website at https://depts.washington.edu/owrc.