Welcome to Science Education 480!

SCED 480: Experiencing elementary science methods through the lens of a learner and future science teacher.

Instructor: Lauren Dudley (she/her/hers)

Email: dudleyl2@wwu.edu

Office: CB281

Feel free to contact me outside of class hours. Come find me in my office outside the Learning Resource Center in SMATE 221 or CB281 or SL230 before/after class or email me.

Meeting Spaces: SL230 MWF 10-11:50 am

Office Hours: By appointment

Set up a meeting with me using this link: https://calendly.com/Lauren-dudleyLinks to an external site.

Need a Zoom office hour in the evening? No problem! Email me for more information :)

Communication: Email is the most efficient way to get in contact with me. Canvas is fine but it takes me a bit longer to reply.

Together, we will unpack and critique science education literature, experience and debrief about elementary science lessons and review curricula. During this course, you will gain perspective on your own experiences as a learner of science, consider multiple frameworks around how to define what science is and who can be a scientist, all the while amassing techniques and strategies to engage k-5 learners. My hope is that by the end of this course, all of my students have increased confidence, knowledge and enthusiasm to be effective science teachers!

Credits: 5

Note: It is strongly advised that students are prepared to take SCED 480 and SCED 490 in consecutive quarters with the same instructor.

Prerequisites & Notes: Completion of Natural Science GURs, including SCED 201 or permission of instructor; SCED 202, SCED 203, and SCED 204 are highly desired GURs; ELED 370 or ELED 372 or SPED 420.

Flexibility; imperative in teaching and learning. In order to be flexible and responsive to the needs and interests of preservice teachers and our public school partnerships, this course agenda is subject to change. Changes, if any, will be announced in Canvas Announcements.

Here's a snapshot of our schedule

MWF 10-11:50 am

Week	Essential Question/Theme
1	Module 1: How does one's identity affect the way they view science?
2	Module 2: What is 'science'?
3	Module 3: What should elementary students learn in science?
4	Module 4: How do I use the Next Generation Science Standards?
5	Module 5: What is 'effective science instruction'?
6	Module 6: What *learning cycle* takes into account How People Learn and Effective Science Instruction?
7	Module 7: How do we support student sense-making in science?
8	Module 8: How do teachers use assessment to inform instruction?
9	Module 9: How can we create classrooms that honor diversity, promote equity, and foster inclusion?
10	Module 10: Pulling it all Together
Finals	Evidence of Student Learning Reflection

Course Goals & Objectives:

In this course, prospective teachers (you!) will:

1. Examine your beliefs in relation to a vision of effective science teaching and learning
    - Preservice teachers will analyze how their experiences as a learner have shaped their definition of, attitudes toward, and interest in science
    - Preservice teachers will critically examine their conception of 'effective' science teaching and learning, informed by their experiences as both a learner and teacher of science
2. Deepen your subject matter knowledge for teaching science
    - Preservice teachers will critically examine classroom interactions for evidence of student engagement in the practices of science (ie, 'doing science')
    - Preservice teachers will describe elements of the Nature Of Science (NOS), and explain its importance to science instruction
    - Preservice teachers will be able to articulate what students should learn in elementary science, identify big ideas or concepts, and build coherent conceptual storylines
3. Develop an understanding of learners, learning, and issues of diversity and equity in science
    - Preservice teachers will unpack the implicit messages experienced in the educational setting that convey *who* can be a scientist and *how* science is learned
    - Preservice teachers will utilize developmentally appropriate and productive approaches to meet the diverse needs, interests, and abilities of students and create inclusive and equitable science classrooms
    - Preservice teachers will understand the role of place and importance of cultural relevance in science education
4. Develop a beginning repertoire of strategies for science instruction and assessment
    - Preservice teachers will design lessons aligned to the Next Generation Science Standards that reflect principles of effective science teaching and learning
    - Preservice teachers demonstrate appropriate design of assessment for formative and summative purposes
5. Develop the tools and dispositions to study and learn from teaching
    - Preservice teachers will utilize feedback and reflection (from peers/instructors/cooperating teachers) to improve their teaching
    - Preservice teachers will apply different lenses (e.g., instructional frameworks, research) to analyze and learn from their science teaching and learning experiences

These course goals align with and build toward our SMATE Program Outcomes:

Students who graduate from our program can:

1. Demonstrate understanding of science and engineering as defined by three dimensions of science and engineering in the Next Generation Science Standards: disciplinary core ideas, scientific and engineering practices, and crosscutting concepts.
2. Demonstrate functional understanding of science that enables them to design science learning experiences that accurately convey what science is and how science works.
3. Demonstrate knowledge of and ability to apply research-based elements of effective instruction, including applying the Next Generation Science Standards to teach three-dimensionally.
4. Demonstrate functional understanding of culturally appropriate teaching strategies that enable students to design learning experiences that recognize and leverage the assets of diverse learners.
5. Demonstrate functional understanding of how systemic oppression and one's own identity impacts teaching and learning, that enables students to design science learning experiences that respond to multiple identities and disrupt oppressive ideologies, policies, and behaviors in the classroom.
6. Demonstrate understanding that one's own teaching ability will develop over time through experimentation and purposeful reflection in order to design STEM learning environments that continuously improve from implementation of new or revised activities.

Assignments

This is a learning partnership. This course and these assignments can be improved when you include your life experience and expertise. Please share that with all of us!

Assignments are intended to help you meet specific objectives that align with the course goals listed above. Each assignment will be explained in detail with a rationale and evaluation criteria. Note that in addition to ***graded assignments***, you will complete a number of ***ungraded assignments*** that will act as baseline assessments or that as 'works in progress' will not be counted towards your final grade. Weighting of individual assignments towards the final course grade are indicated.

1. Reading Responses (10%)
2. Foundational Work and Attendance (10%)
3. Graded Projects (80%)
    - Science Autobiography
    - Lesson Plan Task
    - Wonder Assignment
    - Unit Design Project
    - Evidence-based Learning Self-Assessment

Course Organization and Requirements

Structure: This course is organized into weekly modules that include activities (both in and out of classroom) focused on an essential question or theme . All content, assignments, and assessments for a particular week can be found within that week's module in Canvas. The weekly schedule is sequenced in a "5E learning cycle" to build from your prior knowledge and experiences around the current theme. If you miss class, you will miss part of the learning cycle, making deep and meaningful learning harder to attain.

Attendance/participation: In order to maximize learning, we need you in class! In a perfect world, we'd all have perfect attendance-- in recognition that we don't live in a perfect world, and that things will inevitably come up that mean you need to miss class, you are permitted up to two absences without impact on your course grade. You do not need to provide a reason or excuse for these absences-- I do ask that you contact me so I can plan accordingly (e.g., adjusting groups tasks as needed) and provide you with an opportunity to make up any work that you miss.

If you find you need to miss more than two classes, you might be overextended-- I ask that you come see me to talk about your options. Missing more than two classes does not mean you automatically fail, but each absence above 2 will result in a deduction of your course grade. In the event you extenuating circumstances prevent you from completing the course, an incomplete (K) grade might be an option. In this situation, we will meet to develop an incomplete (K) grade contract that specifies a timeline for completing the work.

Cell phone/Tech policy: During class, we will be spending time sharing, listening, and collaborating on all things science teaching. This means that use of cell phones, laptops, and other electronic devices should be turn on silent and put away unless necessary for the activities we are doing in class. If you have any emergencies, planned or otherwise, please let me know as soon as possible.

Late Work: late work is accepted but only up to one week after the due date. Turning in late work will affect your assignment - 2% deduction for each 24 hr period late (up to 14% reduction max before it becomes a zero). Please try to stay on schedule with due dates. This will make my grading job more streamlined and you gaining feedback sooner. For me to accept late submission or consider adjusting grades, you must:

1. ask for an accommodation before the due date
2. ask clarifying questions before the due date
3. provide evidence for why an error in grading has occurred by going through the revision history of the document to provide a screenshot at the time of submission, showing and justifying that you had all of the required components

Grading Scheme

Everyone can be successful in this course. While many of the assignments are graded complete/incomplete or not graded, you will get out of this class as much effort and reflection as you put into activities and assignments. Much of my feedback is formative in nature. You will receive much more oral feedback than written feedback.

Assignments will be graded, and course grades determined as follows:

Grade	A	A-	B+	B	B-	C+	C	C-	D+	D	D-	F/Z
4-point	4.0	3.7	3.3	3	2.7	2.3	2	1.7	1.3	1	0.7	0
10-point	10	9.3	8.9	8.6	8.3	7.9	7.6	7.3	6.9	6.6	6.3	6.3>
100-point	100	93	89	86	83	79	76	73	69	66	63	63>

Note: A grade of C- or lower in this course will require you to re-take SCED 490. In addition, you will be asked to meet with your academic advisor for support and to develop an improvement plan.

Written assignments must model appropriate grammar, spelling, usage and punctuation. Proofread your papers as you would if you were developing a handout for students or parents.

If you struggle with written assignments, I can often accommodate with an oral/in person submission. Or, visit The Hacherl Writing Center on the second floor of Haggard Hall : https://library.wwu.edu/rws

Texts and required materials

- Readings and supplemental materials will be provided in Canvas or made available via the web or Western Libraries.
- Internet access for various resources and platforms, not limited to: Zoom Links to an external site., FlipgridLinks to an external site.Links to an external site., Canvas, G-Suite Apps. Links to an external site.

Physical and Mental Health (Student Services)

Your well-being is both important to me and essential for you to maintain in order to meet the demands of your future teaching career. Please communicate with me if there is anything I can do to support your health this quarter. It's part of my core beliefs that students (of all ages) cannot access academics if their needs are not being met.

Western encourages students to seek assistance and support at the onset of an illness, difficulty, or crisis. As your instructor, I can be a first point of contact to help you find the campus-based resources you may need. Here are some of the resources WWU offers students:

- In the case of a **medical concernor question**, please contact the Health Center (360) 650-3400 or visit its website: https://studenthealth.wwu.edu/Links to an external site.
- In the case of an **emotional or psychological concern or question**, please contact the Counseling Center: (360) 650-3400 or visit its website: http://www.wwu.edu/counseling/Links to an external site.
- In the case of a **safety concern**, please contact the University Police: (360) 650-3555 or visit its website: http://www.wwu.edu/ps/police/(Links to an external site.)Links to an external site.

- In the case of a **family or personal crisis or emergency**, please contact the Office of Student Life (360) 650-3706 or its website: https://wp.wwu.edu/officeofstudentlife/(Links to an external site.)Links to an external site.
- In case of need for**academic support** of assignments/writing papers, please contact The Hacherl Writing Center on the second floor of Haggard Hall : https://library.wwu.edu/rws (Links to an external site.)
- In case of i**llness including COVID,** please contact the Office of Student: https://wp.wwu.edu/officeofstudentlife/Links to an external site.

Syllabus Policies

This course will adhere to Western's Syllabi PoliciesLinks to an external site. for Academic Honesty, Accommodations, Ethical Conduct with WWU Network and Computing Resources, Equal Opportunity, Student Conduct Code, and Medical Excuse Policy.

Third-Party Software and FERPA: During this course you might have the opportunity to use public online services and/or software applications sometimes called third-party software such as a blog or wiki. While some of these are required assignments, you need not make any personally identifying information available on a public site. Do not post or provide any private information about yourself or your classmates. Where appropriate you may use a pseudonym or nickname (ensuring the facilitators know how to identify you). Some written assignments posted publicly may require personal reflection/comments, but the assignments will not require you to disclose any personally identifiable/sensitive information. If you have any concerns about this, please contact your instructor. See FERPA Toolkit (Links to an external site.)Links to an external site..