Welcome to the Theory and Practice of Teaching Science! I am so excited to get to spend this quarter with you learning about and figuring out effective science teaching. Please know I am here to support and help you in any way I am able. Feel free to email me, text me or call me with your questions, concerns, brainstorms or challenges. We will partner together for a successful experience in applying what you have learned to your classroom experience. I can be reached at dnovak@district30.org. I can also meet in person by appointment. On the night of our course, I will usually arrive at campus between 4:30 and 5:00. Let me know ahead of time if you want to meet before class.

Course Description: The main purpose of the Theory and Practice of Teaching Seminar is to help you synthesize and then apply what you have learned in your education classes up to this point in an actual classroom setting. In our course, we will investigate current theory and practice of teaching science then we will reflect on and develop ways to apply what we learn in our course to your classroom experiences to support your growth and development as a teacher. The seminar course will be a safe, supportive and encouraging place to reflect, share your observations and questions, and discover ways to find success as you work towards developing your craft as an educator. All successful and effective teachers reflect constantly on what goes well, what students understand, what needs to be re-taught, ways to encourage student ownership, and ways to collect evidence of student understanding. You will be collecting field notes during your classroom visits to be used in our class and to help you begin the process of reflecting on teaching practices and experiences.

Main Course Objectives:
1. Students will develop the art of reflecting on teaching practices, the art of questioning in the classroom, & the art of inquiry.
2. Students will make connections between class discussions, readings and field experiences and their personal experiences.
3. Students will learn about the teaching cycle (planning, teaching, assessing learning, and reflecting). Then, they will learn about the interconnectedness of these components of the cycle and how to work through each component through field examples to prepare them for student teaching.

Course Flexibility and Student Input: This syllabus had been created in collaboration with your high school science methods teacher. One of our goals is to develop cohesion between what you are learning in your methods course and what you will look for and try out in your field experience. However, this course will develop and evolve based on our experiences and needs that might be unique to your field experiences. Therefore, think of this syllabus as a “live” document that can (and most likely will) change to adjust to everyone’s needs. We will unfold the flow and development of our course based on questions, concerns, insights and ideas that you all bring to class.

Digital Tools

<table>
<thead>
<tr>
<th>Canvas</th>
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<tr>
<td>We will use Canvas as our management system. In Canvas, you will find assignments, discussions, readings and weekly announcements or updates. There will be a weekly discussion thread for us to continue our work outside of class. Please check Canvas regularly.</td>
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<tr>
<th>EdThena</th>
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<tr>
<td>We will use EdThena, an online platform, to share and annotate videos. You will continue to use this platform next quarter for the student teaching seminar and completion of your edTPA portfolio. You will receive information about purchasing your EdThena membership; grants to cover the fee are also available based on financial need.</td>
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Observations and Field Notes
You will keep field notes from all your classroom visits. I will share with you the format of these notes on our first night together. These field notes will serve as an invaluable resource for reflecting on your experiences in the classroom. This will be a place you can keep track of ideas and strategies that you observe that you would like to try in your own classroom one day. These notes will also serve as a place to reflect on what makes a strategy, question, or activity successful in a science classroom. You might find some of your field note will be useful for some of our assignments and in addition may be useful for other projects including your edTPA and master’s action research project.

Grading, Assignments and Assessments
Our course will be a safe place for us to try things out, learn from each other, support each, and grow through activities, readings, discussions and simulations. In order for all of us to benefit and grow, it is important for everyone to attend our classes and to participate regularly. In addition, is it expected that you will complete all course assignments. You are expected to participate regularly in live class discussions as well as on line discussions. In your practicum sites, you will observe students and teachers, interview your mentor(s) and at least one student, and take careful field notes during each visit. Components of assessment in this course include: attendance and participation, field notes, mentor evaluation, observations analyses, course portfolio and video analyses.
Weekly Update
Before each class, by 8:00 pm Wednesday night, you will need to submit a “Weekly Update”. This can be submitted to me either through Canvas, email, or handwritten. The purpose of this update is to share and reflect with me what you have observed at your teaching location and to ask any questions you may have. This is a private “conversation” between you and me. These updates do not need to be long or any specific format. I will use these updates as formative feedback to make adjustments to the plan for our weekly seminar class.

Ideas for questions you can use to put together your Weekly Update. You do not need to answer all of these.

- What was surprising to you this week during your observation?
- What is one success, or positive, experience you observed? What was one challenge you observed – or – what is one concern you have about what you observed?
- What is the current topic of study?
- What did you do in the field this week? (ie: did you work with a student, did you work with a small group, did you do things for your mentor teacher, did you meet other teachers at the school, etc.)
- What questions do you have about your field experience this week?
- In what ways can I help you this week?

Texts and Materials
We will use the same two texts that you are using in your methods course:


In addition to using these three texts, there will be articles, videos and other resources shared in class through Canvas. Please plan to check Canvas regularly for any updates to resources to read or watch in preparation for our course. There are some I have already chosen and added to the syllabus, but based on issues that come up in our class discussions or topics that are shared after field experiences, there may be other resources added.

Some suggested texts:


Academic Integrity
Students in this course are required to comply with the policies found in the booklet, “Academic Integrity at Northwestern University: A Basic Guide”. All work for this course will be submitted electronically via email (dnovak@district30.org) or through Canvas. Your written work will be tested for plagiarized content. For details regarding academic integrity at Northwestern or to download the guide, visit: [http://www.northwestern.edu/provost/policies/academic-integrity/index.html](http://www.northwestern.edu/provost/policies/academic-integrity/index.html). While the guidelines for academic integrity at Northwestern prohibit students from submitting identical or similar work for credit in more than one course, these guidelines are modified for this here. Your courses are all working towards the same goal; providing you, as a teacher scholar, culminating experiences to support synthesis and application of theories and practices. It is likely that as you synthesize and expand your thinking, there will be some overlap between this course, your action research project and completion of the EdTPA.

Accommodations for Students with Disabilities
I am committed to ensuring that this class is fully accessible to every member of our learning community. If anything is keeping you from success in this class, please let me know and we will work together to develop strategies for your success. I am here to adapt this course to best meet your readiness and needs.

In compliance with Section 504 of the 1973 Rehabilitation Act and the Americans with Disabilities Act, Northwestern University is committed to providing equal access to all programming. Students with disabilities needing accommodations are encouraged to contact AccessibleNU at 467-5530 or [accessible@northwestern.edu](mailto:accessible@northwestern.edu). AccessibleNU is located in Suite 130 of 2122 Sheridan (formerly known as Seabury). AccessibleNU also has an excellent web site, which is viewable at: [http://www.northwestern.edu/accessible/](http://www.northwestern.edu/accessible/).

**Illinois Professional Teaching Standards (2013)**
Learning goals for ourselves

This course will emphasize all elements of the Conceptual Framework as well as cultivate the six dispositions and work towards the Social Emotional Learning goals for ourselves, and our students.

**Illinois Social and Emotional Learning Standards**

<table>
<thead>
<tr>
<th>Goal</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Develop self-awareness and self-management skills to achieve school and life success.</td>
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<tr>
<td>2</td>
<td>Use social-awareness and interpersonal skills to establish and maintain positive relationships.</td>
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<tr>
<td>3</td>
<td>Demonstrate decision-making skills and responsible behaviors in personal, school and community contexts.</td>
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**Dispositions**

Dispositions are habits of professional action and moral commitment to teaching. The program will help candidates develop the following dispositions:

1. Willingness to systematically reflect on one's own practice.
2. Commitment to understanding students' thinking about the subject matter.
3. Belief in the value of seeing students as individuals.
4. Enthusiasm for learning and teaching through collaboration.
5. Willingness to take the risks associated with engaging students' interests through real-world experiences.
7. Commitment to conducting one's self professionally and responsibly.

**The guiding principle of the School of Education and Social Policy** lies in our vision of learning, learners, and teaching as interdependent and ever changing. We understand that learning takes place in all stages of life and in many different settings, not only in schools. We view increasing diversity in the world as a rich resource for authentic learning. Ours is a vision firmly grounded in everyday experience in the classroom and beyond. Through research and reflection, we seek to understand the nature of learning communities and how innovations in pedagogy, technology and social policy can improve our institutions and our lives.
Week 1: September 27  

Who gets to decide what and how we teach in schools? Whose interests are(n't) being served?

Observation Focus: How does your teacher begin the school year? What does he/she do to build a culture and learning community with his/her students? How does the teacher share expectations and rules or norms? What do the students learn on the first day?

ILPT Standards: 1C,1F, 2C, 4A, 4B, 4C, 8A, 8E

Week 2: October 4  

What is the role of phenomena?

Class Focus: How does how we arrange and organize our classroom affect student success and engagement? How important is it to use phenomenon in a science classroom? What is the role? How does the phenomenon used impact student engagement?

Observation Focus: What is the phenomena students are investigating in your field classrooms? What kind of questions are students asking? How are these questions being recorded/answered/part of the learning experience?

ILPT Standards: 1E, 2B, 2C, 2E, 4A, 4C, 5A

Week 3: October 11  

What is the role of questioning in the classroom?

Class Focus: What makes a good question in the science class? How can we practice this with students? Why is it important to help students in the practice of asking good questions?

Observation Focus: This week focus closely on students. As you watch a lesson your mentor teachers leads, what are students doing during class? How is the teacher facilitating the lesson and learning of students? Is the lesson set up to meet the needs of students? How do you know? Are students learning? How do you know? How does the teacher start class? What method or strategy does he/she use? Then, practice your teacher noticing. Choose one student in each class to focus on for a 10-15 minute span of time. Use the following questions as a guide for what to notice and record in your field notes: what do you notice about your chosen student? How might knowledge of this student help in planning instruction? Does the student have any special learning needs? What is your student contributing to class through action or talk? How has the teacher’s strategies encouraged student engagement? What is the evidence of this engagement? How has the teacher assessed for learning?


ILPT Standards: 2D, 2E, 2G, 3A, 3B, 5A, 5B, 9F

Week 4: October 18  

What does a scientific model look like and how can we use it to gauge student understanding?

Class Focus: What does a scientific model look like? What should be included in models in the science classroom and how can they help us gauge student understanding?

Observation Focus: Do students develop their own models in the classroom? What purpose does this serve? Do they use these models to explain their thinking or to catalog phenomenon they observed or to make sense of an investigation? How does your mentor teacher use the student models?

ILPT Standards: 2B, 2C, 2E, 4A, 4B, 4C, 4G, 5F, 5G, 7A, 9E, 9F

Week 5: October 25  

What does productive discourse look like?

Class Focus: What is science discourse? What is classroom discourse? Why is it necessary in helping students learn?

Observation Focus: Who is talking in your field classroom? What types of questions does the teacher ask? What kinds of questions are students asking? How are the questions being asked encourage (or discourage) discourse? What “talk moves” are you able to notice? Is there equal access for all students to be part of the discourse? What strategies does the teacher use if he/she notices the same students are always participating in the discourse? How can we ensure all voices are heard in the classroom? Chart discourse patterns in your classroom during one discussion. Bring this to our class to analyze.

ILPT Standards: 1C, 2B, 2E, 2G, 3A, 3B, 4A, 4B, 5A, 5B, 7A, 7B, 7E, 8E

Week 6: November 1  

What are students figuring out? What will students be figuring out in your class?

Class Focus: How can we support students in making sense of new ideas as they grapple with explaining and modeling phenomenon without “giving away” the science? What is our role as the teacher (or facilitator of learning)?

Observation Focus: What are the goals of the lesson? How do the goals or questions of the lesson fit or connect to the driving question of the unit? What standards does the lesson (and/or unit) focus on? How do you know this? How are the standards and goals of the lesson (and/or unit) made clear to students? How does the teacher connect today’s lesson to the last class?

ILPT Standards: 1C, 2B, 2E, 2G, 3A, 3B, 4A, 4B, 5A, 5B, 7A, 7B, 7E, 8E
**Week 7: November 8**

**What are some ways we can support equity in the classroom and get full engagement?**

**Class Focus:**
What are some ways we can support equity in the classroom and get full engagement by all students?

**Observation Focus:** This week think about academic language. How does your mentor address academic language? How are students involved with making sense of academic language? What supports are offered for students with linguistic needs? Do all students seem to have a model or understanding of the academic language shared in class? What is your evidence?

**ILPT Standards:** 4E, 4G, 5G, 7A, 7B, 7E,

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**Week 8: November 15**

**What does it look like when students are meeting performance expectations?**

**Class Focus:**
How do we support students in learning how to write evidence-based explanations? How do explanations serve as an assessment tool? How is this different from the scientific method?

**Observation Focus:** What do your mentor’s daily plans look like? How does your mentor keep track of where students end up at the end of one day and where to start on the next day? Is there flexibility in the plans? Are practices and cross-cutting concepts part of the plans? How, and how do students know this is part of the plan?

**ILPT Standards:** 2B, 2C, 2D, 2E, 2G, 5A, 5E, 7B, 7E

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**Week 9: November 29**

**What do instructional materials that support 3-D learning look like? How do we build 3-D lessons aligned to NGSS?**

**Class Focus:**
How do we provide feedback that encourages a growth mindset instead of a mindset of learning that ends when a grade is given?

**Observation Focus:** This week you can choose what you are focusing on in your observation. Be sure to share your focus in your field notes.

**ILPT Standards:** 2B, 2C, 2D, 2E, 2G, 5A, 5E, 7B, 7E

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**Week 10: December 6**

**What does 3-D teaching look like?**

**Class Focus:**
What should you do to prepare for winter quarter?

**Observation Focus:** This week you will focus on the classroom learning community. Think about classroom management, differentiation, discipline and the relationships between teacher, students and peers. Some guiding questions to help you reflect on the classroom community include: how does your mentor build relationships with the students? What type of classroom environment has been established and encouraged by your mentor? What kinds of routines are in place that support the learning community and encourage student involvement and ownership in the classroom? How does your teacher handle discipline and management in the classroom? When do you notice students are fully engaged and on task and when do you notice students being disruptive or off task?

**ILPT Standards:** 1C, 1E, 1F, 5A, 8A, 8D, 8E