**Fall 2025: EDEE 3330.021 Teaching Science EC-6**

**Time: Wednesdays 9:00 am – 11:50 pm, Location: Mathews Hall Room 111**

Instructor Information

|  |
| --- |
| EDEE 3330 Teaching Science EC-6Section 021 |
| Fall 2025 |
| InstructorDr. Nazia Khan | PronounsShe/Her/Hers |
| Office locationMathews Hall Room 204EPersonal Zoom Link in Canvas.  | Office hoursMondays 8:30 am – 1 pm, Wednesdays 12:00 pm-1:30 pm.  |
| Contact information: Nazia.Khan@unt.edu940-565-2754 | Final Exam In canvas |

Course Description, Structure, and Objectives

# **Course Prerequisites**

Admission to the teacher education program, which includes participation in a field-based program, EDEE 3320, 3380; all courses in the reading/English/language arts part of the academic major (visual art, music, and theatre arts); and required core and academic major science courses and DFST classes. This course is to be taken in Block A of the teacher education program.

# **Catalogue Description/Course Description**

EDEE 3330: 3 hours. Science Grades EC-6

Introduces students to the scope and sequence of science education in an elementary school setting, lesson plans and lesson design inside both formal and informal learning settings.

# **Course Structure**

This course takes place 100% in Matthews 111. All interaction with me and with your fellow students will take place in Matthews 111. There are 15 weeks of content that you will move through.

# **Course Objectives**

1. Upon successful completion of the course activities students will be able to:
2. Demonstrate professional skills, knowledge, and attitudes as outlined in the Texas Teachers Proficiencies Identify science materials and lessons to address the appropriate Science Content contained in the Texas Essential Knowledge and Skills.
3. Plan, develop, and implement inquiry-learning activities that follow accepted practice of inquiry-based science in the 5E format.
4. Select (and adapt if necessary) activities and lessons from various resources to an appropriate style and sequence based on science education research.
5. Organize and manage a safe hands-on approach to science instruction.
6. Make connections between teaching and learning how to be a science educator.
7. Demonstrate an understanding of the true nature of lesson planning.

Safety procedures and guidelines:

While working in laboratory sessions, students enrolled in [insert class name] are required to follow proper safety procedures and guidelines in all activities requiring lifting, climbing, walking on slippery surfaces, using equipment and tools, handling chemical solutions and hot and cold products. Students should be aware that UNT is not liable for injuries incurred while students are participating in class activities. All students are encouraged to secure adequate insurance coverage in the event of accidental injury. Students who do not have insurance coverage should consider obtaining Student Health Insurance. Brochures for student insurance are available in the UNT Student Health and Wellness Center. Students who are injured during class activities may seek medical attention at the Student Health and Wellness Center at rates that are reduced compared to other medical facilities. If students have an insurance plan other than Student Health Insurance at UNT, they should be sure that the plan covers treatment at this facility. If students choose not to go to the UNT Student Health and Wellness Center, they may be transported to an emergency room at a local hospital. Students are responsible for expenses incurred there.

Pedagogy and Professional Responsibility Standards (PPR)

* Knows and understands the importance of the state content and performance standards as outlined in the TEKS.
* Uses the TEKS to plan instruction.
* Knows and understands the importance of designing instruction that reflects the TEKS through Grade 6.
* Plans instructional activities that progress sequentially and support stated instructional goals based on the TEKS through Grade 6.
* Knows the connection between the statewide Texas assessment program, the TEKS through Grade 6, and instruction.
* Standard I: Domain I: Competency 001-004 Domain III: Competency 007-010: The teacher designs instruction appropriate for all students that reflects an understanding of relevant content and is based on continuous and appropriate assessment.
* Standard II: Domain II: Competency 005-006: The teacher creates a classroom environment of respect and rapport that fosters a positive climate for learning, equity and excellence.
* Standard III: Domain III: Competency 007-010: The teacher promotes student learning by providing responsive instruction that makes use of effective communication techniques, instructional strategies that actively engage students in the learning process and timely and high-quality feedback.
* Standard IV: Domain IV: Competency 011-013: The teacher fulfills professional roles and responsibilities and adheres to legal and ethical requirements of the profession.
* Technology Applications Standard I: Domain III: Competency 007-010: All teachers use technology-related terms, concepts, data input strategies and ethical practices to make informed decisions about current technologies and their applications.
* Technology Applications Standards II: Domain III: Competency 007-010: All teachers identify task requirements, apply search strategies and use current technology to efficiently acquire, analyze and evaluate a variety of electronic information.
* Technology Applications Standard III: Domain III: Competency 007-010: All teachers use task-appropriate tools to synthesize knowledge, create and modify solutions and evaluate results in a way that supports the work of individuals and groups in problem-solving situations.
* Technology Applications Standard IV: Domain III: Competency 007-010: All teachers communicate information in different formats and for diverse audiences.
* Technology Applications Standard V: Domain III: Competency 007-010: All teachers know how to plan, organize, deliver and evaluate instruction for all students that incorporates the effective use of current technology for teaching and integrating the Technology Applications Texas Essential Knowledge and Skills.

Curriculum Topics

* Code of Ethics per Chapter 247: Domain II, IV
* TEKS organization, structure, and skills: Domain I, III
* State assessment of students (STARR Responsibilities): Domain I, II, IV
* Curriculum development and lesson planning: Domain I, II, III
* Classroom assessment for instruction/diagnosing learning needs: Domain I, III
* Instructional technology: Domain I,III
* Pedagogy/Instructional strategies: Domain I, III, IV
* Differentiated instruction: Domain I, II, III, IV
* Classroom Management: Domain II, IV

How to Succeed in this Course

UNT strives to offer you a high-quality education and a supportive environment, so you learn and grow. As a faculty member, I am committed to helping you be successful as a student. To learn more about campus resources and information on how you can be successful at UNT, go to [unt.edu/success](https://www.unt.edu/success/) and explore [unt.edu/wellness](https://wellness.unt.edu/). To get all your enrollment and student financial-related questions answered, go to [scrappysays.unt.edu](http://scrappysays.unt.edu/).

Office hours offer you an opportunity to ask for clarification or find support with understanding class material. Come visit me! I encourage you to connect with me for support. Additional office hours, in person and virtually, will be offered as the semester concludes. Your success is my goal.

Artificial Intelligence (AI) Use in This Course

There will be certain assignments in this course where the use of AI is not permitted. These will be clearly marked, and using AI on them will be considered academic dishonesty under the University’s Academic Integrity Policy; https://policy.unt.edu/sites/policy.unt.edu/files/06.003%20Student%20Academic%20Integrity.pdf. This policy is not only about compliance, but it is also about protecting your own learning. Over-reliance on AI can limit your ability to practice critical thinking, communication, and other skills this course is designed to develop

Supporting Your Success and Creating an Inclusive Learning Environment

The University of North Texas makes reasonable academic accommodation for students with disabilities. Students seeking reasonable accommodation must first register with the Office of Disability Access (ODA) to verify their eligibility. If a disability is verified, the ODA will provide you with a reasonable accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request reasonable accommodations at any time; however, ODA notices of reasonable accommodation should be provided as early as possible in the semester to avoid any delay in implementation. Note that students must obtain a new letter of reasonable accommodation for every semester and must meet with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of reasonable accommodation during faculty office hours or by appointment. Faculty members have the authority to ask students to discuss such letters during their designated office hours to protect the privacy of the student. For additional information, refer to the [Office of Disability Access](https://studentaffairs.unt.edu/office-disability-access) website (<https://studentaffairs.unt.edu/office-disability-access>). You may also contact ODA by phone at (940) 565-4323.

Every student in this class should have the right to learn and engage within an environment of respect and courtesy from others. We will discuss our classroom’s habits of engagement and I also encourage you to review UNT’s student code of conduct so that we can all start with the same baseline civility understanding ([Code of Student Conduct](https://policy.unt.edu/policy/07-012)) (<https://policy.unt.edu/policy/07-012>).

Required/Recommended Materials

Textbook is available on Canvas:

National Academies of Sciences, Engineering, and Medicine. 2023. Rise and Thrive with Science: Teaching PK-5 Science and Engineering. Washington, DC: The National Academies Press. https://doi.org/10.17226/26853.

All course readings are available online/Canvas.

Course Requirements/Schedule

|  |  |  |
| --- | --- | --- |
| **Assignments** | **Due** | **Percent** |
| **Major Assignments** |  |  |
| Safety in the Science Classroom | 9/10 | **10%** |
| Draft Science Lesson Plan | 10/15 | **10%** |
| Microteaching | 10/28, 11/5. & 11/5 | **10%** |
| Science Lesson Plan Final Submission  | 11/18 | **10%** |
| Microteaching Reflection Essay  | 12/8 | **10%** |
| **Completion Assignments** |  |  |
| Teaching Science in Elementary Classrooms  | Weeks 9 & 10  |  |
| **Class Journal Entry** |  |  |
| Science Journal Entry 1: Reflections - Chapter 1 Moving to “I Can Teach Like This”  | Week 2 | **5%** |
| Science Journal Entry 2: Reflections - Chapter 2 Bringing Out the Brilliance of All Children | Week 3 | **5%** |
| Science Journal Entry 3: Reflections - Chapter 3 Starting Strong with Investigation and Design | Week 4 | **5%** |
| Science Journal Entry 4: Reflections - Chapter 4 Letting Children Lead During Investigation and Design | Week 5 | **5%** |
| Science Journal Entry 5: Reflections - Chapter 5 All Together Now: Supporting Communication and Collaboration | Week 6 | **5%** |
| Science Journal Entry 6: Reflections - Chapter 6 Revealing Learning through Assessments | Week 7 | **5%** |
| Science Journal Entry 7: Reflections - Chapter 7 Everything Is Connected: Integrating Science and Engineering with Instruction in Other Subjects | Week 8 | **5%** |
| **Final Exam – Online** | **Week 16** | **10%** |
| Attendance and Participation |  | **5%** |
|  | **Percentage** | ***100%*** |

**Course Assignment Descriptions**

**In-Class Assignments and Major Assignments** (55%) Most of the student learning, activities, and collaboration will take place during our scheduled meeting time. Activities include safety in the science classroom, discussions and experiments, microteaching presentations, and lesson planning. Attendance and participation will be included as part of your in-class assignments since this course involves collaboration, participation is essential to learning. The activities require you to be actively engaged in discussions and group work. I understand tardiness and absences may occur. If you are late to class, please drop me an email to let me know the circumstances. If you must miss class, please let me know prior to your absence and you will be responsible for missed work or late work.

**Class Journal Entries** (35%) To deepen your understanding of scientific concepts presented in the text by reflecting on and analyzing key scientific ideas, experiments, and theories discussed in the book. This assignment aims to integrate theoretical knowledge with practical application and enhance critical thinking through reflective journaling in teaching science. Your task is to maintain a journal with entries that reflect on and critically analyze the scientific content presented in the book. Each entry should connect the book's content to broader scientific concepts and real-world applications. You are required to submit 7 journal entries with flexibility in submission from formats including essay (300 words), graphic or visual organizer, recording and digital journals.

**Final Assignment** (10%) For the final assignment of this course, you will write a reflective essay based on your experience of writing and microteaching a science lesson. This essay will allow you to analyze your teaching practices, evaluate the effectiveness of your lesson, and reflect on the insights gained from the microteaching experience in front of your peers. Your essay should demonstrate a thorough understanding of pedagogical strategies, classroom management, and the integration of scientific content.

**Completion Assignments** (Complete/Incomplete) In this course, 2 assignments are graded based on a "completed" or "not completed" system. This approach focuses on ensuring that students engage with the material and fulfill the basic requirements of each assignment. The goal is to simplify the grading process while encouraging consistent participation and effort. An assignment is considered "completed" if it meets the minimum requirements outlined in the assignment guidelines.

Students will be notified by Eagle Alert if there is a campus closing that will impact a class and describe that the calendar is subject to change, citing the [Campus Closures Policy](https://policy.unt.edu/policy/15-006) (<https://policy.unt.edu/policy/15-006>).

Assessing Your Work

Grading

Course grade matrix: (for assigning final course grades)

100% – 90% = A

89% – 80% = B

79% – 70% = C

69% – 60% = D

below 60% = F

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  |  | **Percentage** | *100%* |  |

|  |  |
| --- | --- |
| **Week** | **Tentative Schedule** |
| 1 | **TOPIC:** Course Introduction and Class Canvas  |
| **IN CLASS ACTIVITY:**1. Drawing and Narrative – Teaching
2. My Science Instruction Framework
3. **Texas Education Agency Science -** **https://tea.texas.gov/academics/subject-areas/science**
4. Understanding the Course: Front Matter.pdf
5. Sensemaking and Explaining Common Phenomena
 |

|  |  |
| --- | --- |
| 2 | **TOPIC:** Science Instruction Frameworks |
| **READ:** Science Instruction Frames PowerPoint Presentation in Canvas |
| **IN CLASS ACTIVITY (Science Notebook):** 1. Deconstructing a 5E Science Lesson Plan

Science Notebooks VS Science Journals 1. Notetaking in Elementary Science Classrooms
 |

|  |  |
| --- | --- |
| 3 | **TOPIC:** Moving to “I Can Teach Like This”  |
| **READ:** Chapter 1 Moving to “I Can Teach Like This” |
| * Science Journal 1: Reflections - Chapter 1 Moving to “I Can Teach Like This”
 |
| **IN CLASS ACTIVITY** * **Measurement in Elementary Science Classrooms**
 |

|  |  |
| --- | --- |
| 4 | **TOPIC:** Bringing Out the Brilliance of All Children |
| **READ:** Chapter 2 Bringing Out the Brilliance of All Children |
| * Science Journal 2: Reflections - Chapter 2 Bringing Out the Brilliance of All Children
 |
| **IN CLASS ACTIVITY** * **Density Activity**
 |
| **ASSIGNMENT/S DUE THIS WEEK**Safety in the Science Classroom  |

|  |  |
| --- | --- |
| 5 | **TOPIC:** Starting Strong with Investigation and Design |
| **READ:** Chapter 3 Starting Strong with Investigation and Design |
| **IN CLASS ACTIVITY Dissolving Activity** |
| * Science Journal 3: Reflections - Chapter 3 Starting Strong with Investigation and Design
 |

|  |  |
| --- | --- |
| **Week** | **Tentative Schedule** |
| 6 | **TOPIC:** Letting Children Lead During Investigation and Design |
| **READ:** Chapter 4 Letting Children Lead During Investigation and Design |
| **IN CLASS ACTIVITY** * Physical Science
 |
| * Science Journal 4: Reflections - Chapter 4 Letting Children Lead During Investigation and Design
 |

Spring Break Week – No Classes March 4th

|  |  |
| --- | --- |
| 7 | **TOPIC:** All Together Now: Supporting Communication and Collaboration |
| **READ:** Chapter 5 All Together Now: Supporting Communication and Collaboration |
| **IN CLASS ACTIVITY:*** **Leading the class**
 |
| * Science Journal 5: Reflections - Chapter 5 All Together Now: Supporting Communication and Collaboration
 |

|  |  |
| --- | --- |
| 8 | **TOPIC:** Revealing Learning through Assessments  |
| **READ:** Chapter 6 Revealing Learning through Assessments |
| **IN CLASS ACTIVITY:*** **Designing Science Specific Assessments in Elementary Classrooms**
* **Engineering Challenge**
 |
| * Science Journal 6: Reflections - Chapter 6 Revealing Learning through Assessments
 |

|  |  |
| --- | --- |
| 9 | **TOPICS:** 1. Everything Is Connected: Integrating Science and Engineering with Instruction in Other Subjects
2. Teaching Engineering
 |
| **READ:**Chapter 7 Everything Is Connected: Integrating Science and Engineering with Instruction in Other |
| **IN CLASS ACTIVITY** * **Group discussion board**
 |
| * Science Journal 7: Reflections - Chapter 7 Everything Is Connected: Integrating Science and Engineering with Instruction in Other
 |

|  |  |
| --- | --- |
| 10 | **TOPIC:** Nature of Science |

|  |  |
| --- | --- |
| **Week** | **Tentative Schedule** |
| 11 | **CLASS ACTIVITY: *MICROTEACHING*** |
| **9.45am to 10.30am** | **10.40am to 11.25am** | **11.30am to 11:50** |
| ***Microteaching Pair 1*** | ***Microteaching Pair 2*** | ***Microteaching single*** |

|  |  |
| --- | --- |
| 12 | **Peer feedback** |
| **CLASS ACTIVITY: *MICROTEACHING*** |
| **9.45am to 10.30am** | **10.40am to 11.25am** | **11.30am to 11:50** |
| ***Microteaching Pair 4*** | ***Microteaching Pair 5*** | ***Microteaching single*** |

|  |  |
| --- | --- |
| 13 | **CLASS ACTIVITY: *MICROTEACHING*** |
| **9.45am to 10.30am** | **10.40am to 11.25am** | **11.30am to 11:50** |
| ***Microteaching Pair 7*** | ***Microteaching Pair 8*** | ***Microteaching single*** |

|  |  |
| --- | --- |
| 14 | **CLASS ACTIVITY: *MICROTEACHING*** |
| **9.45am to 10.30am** | **10.40am to 11.25am** | **11.30am to 11:50** |
| ***Microteaching Pair 10*** | ***Microteaching Pair 11*** | ***Microteaching single*** |
| **HOMEWORK ASSIGNMENT** Complete the following:1. Beliefs about Science Instruction in Canvas
 |

|  |  |
| --- | --- |
| 15 | **TOPIC:** Finding Your Own Sources of Support  |
| **READ:** Epilogue.pdf |
| **IN CLASS ACTIVITY:**1. Beliefs and Equity in Science Instruction: Reflection and Transformation
2. Drawing and Narrative – Teaching Science
 |
| **ASSIGNMENT/S DUE THIS WEEK** |
| Microteaching Reflection |

Every student in my class can improve by doing their own work and trying their hardest with access to appropriate resources. Students who use other people’s work without citations will be violating UNT’s Academic Integrity Policy. Please read and follow this important set of [guidelines for your academic success](https://policy.unt.edu/policy/06-003) (<https://policy.unt.edu/policy/06-003>). If you have questions about this, or any UNT policy, please email me or come discuss this with me during my office hours.

## Attendance and Participation

**ATTENDANCE EXPECTATIONS:**

Research has shown that students who attend class are more likely to be successful. You should attend every class unless you have a university excused absence such as active military service, a religious holy day, or an official university function as stated in the [Student Attendance and Authorized Absences Policy (PDF)](https://policy.unt.edu/policy/06-039) (<https://policy.unt.edu/policy/06-039>). If you cannot attend a class due to an emergency, please let me know. Your safety and well-being are important to me.

With that said, things come up. When you can’t be in class, I expect you to let me know ahead of time if you can. Missing more than two class periods or missing any class without contacting the instructor will affect the participation portion of your grade and may warrant further administrative action. If you are absent, you are still responsible for turning in assigned work.

.

|  |
| --- |
| 0 – 1 unexcused absence10 points |
| 2 unexcused absences7 points |
| 3 unexcused absences3 points |
| 4 unexcused absencesF in the course  |

**EDUCATOR STANDARDS**

In order to recommend a candidate to the Texas Education Agency, the UNT Educator Preparation Program curriculum includes alignment to standards identified by the State Board of Educator Certification (SBEC). These standards are assessed throughout your preparation and through the TExES Certification exams required for your teaching certificate. The Texas State Board for Educator Certification creates standards for beginning educators. These standards are focused upon the Texas Essential Knowledge and Skills, the required statewide school curriculum. Additionally, the Commissioner of TEA has adopted rules pertaining to Texas teaching standards:

#### **TEXAS TEACHING STANDARDS**

Standards required for all Texas beginning teachers fall into the following 6 broad categories:

1. Standard 1--Instructional Planning and Delivery.
	1. Standard 1Ai,ii,iv
	2. Standard 1Bi,ii (Lesson design)
2. Standard 2--Knowledge of Students and Student Learning
3. Standard 3--Content Knowledge and Expertise
4. Standard 4--Learning Environment
5. Standard 5--Data-Driven Practice
6. Standard 6--Professional Practices and Responsibilities

Full description of the standards and competencies can be accessed using this link: Texas Teaching Standards Adopted in Chapter 149

#### **EDUCATOR STANDARDS FOR EC-6 CORE SUBJECTS:**

A full description of the standards and competencies can be accessed using this link: https://tea.texas.gov/texas-educators/preparation-and-continuing-education/approved-educator-standards

**SCIENCE GENERALIST EC–6 STANDARDS**

* Standard I. The science teacher manages classroom, field, and laboratory activities to ensure the safety of all students and the ethical care and treatment of organisms and specimens.
* Standard II. The science teacher understands the correct use of tools, materials, equipment, and technologies.
* Standard III. The science teacher understands the process of scientific inquiry and its role in science instruction.
* Standard IV. The science teacher has theoretical and practical knowledge about teaching science and about how students learn science.
* Standard V. The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning.
* Standard VI. The science teacher understands the history and nature of science.
* Standard VII. The science teacher understands how science affects the daily lives of students and how science interacts with and influences personal and societal decisions.
* Standard VIII. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in physical science.
* Standard IX. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in life science.
* Standard X. The science teacher knows and understands the science content appropriate to teach the statewide curriculum (Texas Essential Knowledge and Skills [TEKS]) in Earth and space science.
* Standard XI. The science teacher knows unifying concepts and processes that are common to all sciences.

**TEXAS ESSENTIAL KNOWLEDGE AND SKILLS**

The following TEKS are addressed in this course. The Texas Essential Knowledge and Skills can be accessed on the Texas Education Agency Web site using the A-Z index at the following URL: https://tea.texas.gov/academics/curriculum-standards

https://tea.texas.gov/academics/subject-areas/science

# **ENGLISH LANGUAGE PROFICIENCY STANDARDS (ELPS)**

This course incorporates the ELPS in lesson planning and instructional delivery in order to improve language acquisition and content area knowledge of students who are English learners. The ELPs will be implemented by teacher candidates during instruction of the subject area for students who are English learners. The ELPs can be accessed via the Texas Education Agency using the following link: http://ritter.tea.state.tx.us/rules/tac/chapter074/ch074a.html#74.4.

# **TEXAS COLLEGE AND CAREER READINESS STANDARDS**

The Texas College and Career Readiness Standards can be accessed at the Texas Higher Education Coordinating Board Web site using the following link: http://www.thecb.state.tx.us/index.cfm?objectid=EADF962E-0E3E-DA80-BAAD2496062F3CD8