**EDEE 4330.501 Science Grades EC-6.**

**Spring 2020**

Instructor: **Dr. Christopher S. Long,** Assistant Professor.

Location of Class: Frisco Inspire Park Lab

Time of Class: **Thursdays 8:00 – 10:50**

Instructor’s Office: Matthews Hall 218C

Office Hours: **Tuesdays 1:00 to 4:00 (Denton)**

**Thursdays 11:00 to 1:00 (Frisco)**

**Or by appointment**

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**Course Description**

EDEE 4330: 3 hours. Science Grades EC-6

Subject matter background and material organization for an integrated science program in the primary/elementary and middle school. Students experience firsthand the scope and sequence of science education in a primary/elementary/middle school setting (EDME 4330). Assignments: directed field experience and other class activities take place on site in a school setting. Prerequisite(s): admission to the teacher education program, which includes participation in a field-based program, EDEE [3320](http://www.google.com/url?q=http%3A%2F%2Fwww.coe.unt.edu%2Ftea%2Fcourse%2Fedee.htm%233320&sa=D&sntz=1&usg=AFQjCNGYLAdsqaS_8FBf2aKllUIpfy2f0g), [3380](http://www.google.com/url?q=http%3A%2F%2Fwww.coe.unt.edu%2Ftea%2Fcourse%2Fedee.htm%233380&sa=D&sntz=1&usg=AFQjCNGfscmFU7_oaVSQYxkkXLMvdj5OHQ); 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 the professional year.

**Goals and Outcomes**

Upon successful completion of the course activities students will be able to

1. Demonstrate an understanding of the true nature of science (NOS).
2. Demonstrate an in-depth understanding of a major conceptual area in science.
3. Demonstrate professional skills, knowledge, and attitudes as outlined in the *Texas Teachers Proficiencies*.
4. Apply to science lessons the *Scientific Principles* of the Texas Essential Knowledge and Skills required by the state of Texas.
5. Identify and use the *Science Process Skills* as an integral part of science lessons.
6. Identify science materials and lessons to address the appropriate Science Content contained in the Texas Essential Knowledge and Skills.
7. Plan, develop, and implement inquiry-learning activities that follow accepted practice of inquiry-based science in the 5E format.
8. Select (and adapt if necessary) activities and lessons from various resources to an appropriate style and sequence based on science education research.
9. Organize and manage a safe hands-on approach to science instruction.
10. Make connections between teaching, learning, subject areas and your own growth as an educator.
11. Demonstrate arts integration during the delivery of a peer reviewed lesson presentation and within the 5-day thematic unit assignment.

**Science TEKS**

* 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.
* The science teacher understands the correct use of tools, materials, equipment, and technologies.
* The science teacher understands the process of scientific inquiry and its role in science instruction.
* The science teacher has theoretical and practical knowledge about teaching science and about how students learn science.
* The science teacher knows the varied and appropriate assessments and assessment practices to monitor science learning.
* The science teacher understands the history and nature of science.
* The science teacher knows and understands the science content appropriate to teach the statewide curriculum [TEKS] in physical science.
* The science teacher knows and understands the science content appropriate to teach the statewide curriculum ([TEKS] in life science.
* The science teacher knows and understands the science content appropriate to teach the statewide curriculum ([TEKS] in Earth and space science.

**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

**Materials**

Required Texts:

Koch, J. Science stories: Science methods for elementary and middle school teachers (6th ed.). Wadsworth Cengage Learning. ISBN-13:978-1-111-83343-5

Internet Resources:

1. TAKS and TEKS Information booklets: Scroll down to Science and select Grades 5 and 8. (download and print copies) [http://www.tea.state.tx.us/student.assessment/taks/booklets/index.html](http://www.google.com/url?q=http%3A%2F%2Fwww.tea.state.tx.us%2Fstudent.assessment%2Ftaks%2Fbooklets%2Findex.html&sa=D&sntz=1&usg=AFQjCNHPeqJT0wcUjUEmAkx46_8yz6BKqw)
2. University of Texas Dana Center. The Dana Center provides Texas education leaders with new knowledge about teaching and learning. We also support K–12 teachers and leaders working to implement high academic standards for all students. [http://www.utdanacenter.org/](http://www.google.com/url?q=http%3A%2F%2Fwww.utdanacenter.org%2F&sa=D&sntz=1&usg=AFQjCNFXuGymXKRIbY2xLLSsbAzhVpxTHQ)
3. Science Toolkit. Provide resources to help teachers implement the Texas Essential Knowledge and Skills (TEKS) and strengthen mathematics and science education in Texas. [http://www.utdanacenter.org/sciencetoolkit/index.php](http://www.google.com/url?q=http%3A%2F%2Fwww.utdanacenter.org%2Fsciencetoolkit%2Findex.php&sa=D&sntz=1&usg=AFQjCNFv_OIrEZaSzya4L6kMvD2IPHRhaw)

**Expectations**

1. ATTENDANCE - Attend all classes, meetings, etc. arriving on time.
2. PREPARATION - Be prepared to discuss assigned readings and submit assignments according to established deadlines.
3. PARTICIPATION - Contribute constructively and respectfully to all discussions and activities.
4. RESPECT – Do not talk while the teacher or another presenter is speaking.
5. ACADEMIC HONESTY - Know and follow course, departmental, program and university policies on assignments and assessments.
6. PROFESSIONALISM - Know and follow departmental, program and university policies expected of PDS students.

Note: All policies and guidelines described in the UNT COE *Student Teacher Handbook* apply in this course. You are expected to be familiar with this information and follow all policies described in the handbook: [http://www.coe.unt.edu/fep/documents/handbook.pdf](http://www.google.com/url?q=http%3A%2F%2Fwww.coe.unt.edu%2Ffep%2Fdocuments%2Fhandbook.pdf&sa=D&sntz=1&usg=AFQjCNGOijQlaC9e-9vTqcduISFO4w8ORQ)

**Communication**

The official manner of communication outside of class meetings will by email\*. Students should activate and regularly (4-5 times weekly) check their email in WEBCT Vista. WEBCT Vista; [ecampus.unt.edu](http://www.google.com/url?q=http%3A%2F%2Feaglemail.unt.edu&sa=D&sntz=1&usg=AFQjCNF-IyoiVgwjip8m5wmbIrqK4nMqpQ). When sending email to me, use the following instructions:

1. Put EDEE 4330 and sec. # in the Subject line of all email (I may not open it otherwise).
2. Clearly elaborate your question or concern.
3. Include your *full name* after the message.
4. When replying, always copy the original (or previous) message.
5. Email may or may not be responded to during the weekend.

(\*If it is very important, please send via regular email (in addition to WEBCT - thank you.)



***The Educator as Agent of Engaged Learning:***

Improving the quality of education in Texas schools and elsewhere is the goal of programs for the education of educators at the University of North Texas. To achieve this goal, programs leading to teacher certification and advanced programs for educators at the University of North Texas 1) emphasize content, curricular, and pedagogical knowledge acquired through research and informed practice of the academic disciplines, 2) incorporate the Texas Teacher Proficiencies for learner centered education, 3) feature collaboration across the university and with schools and other agencies in the design and delivery of programs, and 4) respond to the rapid demographic, social, and technological change in the United States and the world.

**The educator as agent of engaged learning** summarizes the conceptual framework for UNT's basic and advanced programs. This phrase reflects the directed action that arises from simultaneous commitment to academic knowledge bases and to learner centered practice. "Engaged learning" signifies the deep interaction with worthwhile and appropriate content that occurs for each student in the classrooms of caring and competent educators. "Engaged learning" features the on-going interchange between teacher and student about knowledge and between school and community about what is worth knowing. This conceptual framework recognizes the relationship between UNT and the larger community in promoting the commitment of a diverse citizenry to life-long learning. In our work of developing educators as agents of engaged learning, we value the contributions of professional development schools and other partners and seek collaborations which advance active, meaningful, and continuous learning.

Seeing the engaged learner at the heart of a community that includes educators in various roles, we have chosen to describe each program of educator preparation at UNT with reference to the following key concepts, which are briefly defined below.

1. **Content and curricular knowledge** refer to the grounding of the educator in content knowledge and knowledge construction and in making meaningful to learners the content of the PreK-16 curriculum.
2. **Knowledge of teaching and assessment** refers to the ability of the educator to plan, implement, and assess instruction in ways that consistently engage learners or, in advanced programs, to provide leadership for development of programs that promote engagement of learners.
3. **Promotion of equity for all learners** refers to the skills and attitudes that enable the educator to advocate for all students within the framework of the school program.
4. **Encouragement of diversity** refers to the ability of the educator to appreciate and affirm formally and informally the various cultural heritages, unique endowments, learning styles, interests, and needs of learners.
5. **Professional communication** refers to effective interpersonal and professional oral and written communication that includes appropriate applications of information technology.
6. **Engaged professional learning** refers to the educator's commitment to ethical practice and to continued learning and professional development.

Through the experiences required in each UNT program of study, we expect that basic and advanced students will acquire the knowledge, skills, and dispositions appropriate to the educational role for which they are preparing or in which they are developing expertise.

A broad community stands behind and accepts responsibility for every engaged learner. UNT supports the work of PreK-16 communities through basic and advanced programs for professional educators and by promoting public understanding of issues in education.

*Ethical Behavior and Code of Ethics:* The Teacher Education & Administration Department expects that its students will abide by the Code of Ethics and Standard Practices for Texas Educators (Chapter 247 of the Texas Administrative Code www.sbec.state.tx.us) and as outlined in Domain IV: Fulfilling Professional Roles and Responsibilities of the Pedagogy and Professional Responsibilities (PPR) Texas Examination of Educator Standards (TExES); and as also addressed in codes of ethics adopted by professionals in the education field such as the National Education Association (NEA) and the American Federation of Teachers (AFT).

*Submitting Work:* All assignments will be submitted via Blackboard Learn. Assignments posted after the deadline will be considered late and points will be deducted from the final grade.

*Grading and Grade Reporting:* Grading rubrics for all assignments can be found on the course Blackboard Learn website with the assignment. Students are encouraged to review the grading rubrics to guide them in successfully completing all assignments.

*Writing Policy:* Teachers are judged on the accuracy of everything they write, whether it is a letter to parents or an email to a principal or a worksheet for students. Your written products – including, but not limited to, papers, lesson plans, and emails – should include appropriate and accurate spelling, grammar, punctuation, syntax, format, and English usage. You should expect that all assignments will be evaluated on these writing skills, in addition to any other expectations of a particular assignment. The UNT Writing Lab (Sage Hall 152) offers one-on-one consultation to assist students with their writing assignments. To use this resource, call (940) 565-2563 or visit <https://ltc.unt.edu/labs/unt-writing-lab-home>.

**Teacher Education & Administration**

***Departmental Policy Statements***

*UNT Career Connect:* All undergraduate students are expected to participate in “UNT Career Connect.” Each student needs to set up a UNT e-portfolio for this purpose. As a UNT student engages in real-life, career-related experiences in curricular and/or co-curricular settings, s/he should upload documentation of these experiences into his/her UNT e-portfolio. Course instructors will help students identify appropriate experiences and accompanying documentation/artifacts for inclusion in the e-portfolio. Through their respective e-portfolios, students are able to make connections across their student experiences and reflect upon their learning and skills in order to prepare them with marketable skills for careers and graduate degrees. The e-portfolio also serves as a useful device for future job interviews. Career Connect places emphasis on important job skills such as communication, teamwork, and critical thinking. For students seeking teacher certification, these on-the-job skills will be evaluated during student teaching using the North Texas Appraisal of Classroom Teaching (NTACT) or its successor instrument. Follow this link to learn more and to set up your personal e-portfolio: <http://careerconnect.unt.edu/default> .

*Disabilities Accommodation:* “The University of North Texas complies with Section 504 of the 1973 Rehabilitation Act and with the Americans with Disabilities Act of 1990. The University of North Texas provides academic adjustments and auxiliary aids to individuals with disabilities, as defined under the law. Among other things, this legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you believe you have a disability requiring accommodation, please see the instructor and/or contact the Office of Disability Accommodation at 940-565-4323 during the first week of class.” Dr. Barbara Pazey is the compliance officer and contact person for the Department of Teacher Education & Administration.

*Observation of Religious Holidays:* If you plan to observe a religious holy day that coincides with a class day, please notify your instructor as soon as possible.

*Academic Integrity:* Students are encouraged to become familiar with UNT’s policy on Student Standards of Academic Integrity: <http://policy.unt.edu/sites/default/files/untpolicy/pdf/7-Student_Affairs-Academic_Integrity.pdf>. Academic dishonesty, in the form of plagiarism, cheating, or fabrication, will not be tolerated in this class. Any act of academic dishonesty will be reported, and a penalty determined, which may be probation, suspension, or expulsion from the university.

*Acceptable Student Behavior:* Student behavior that interferes with an instructor’s ability to conduct a class or other students' opportunity to learn is unacceptable and disruptive and will not be tolerated in any instructional forum at UNT. Students engaging in unacceptable behavior will be directed to leave the classroom and the instructor may refer the student to the Dean of Students to consider whether the student's conduct violated the Code of Student Conduct. The university's expectations for student conduct apply to all instructional forums, including university and electronic classroom, labs, discussion groups, field trips, etc. The Code of Student Conduct can be found at <https://deanofstudents.unt.edu/conduct>.

*Attendance:* See the instructor’s attendance policy*.*

*Eagle Connect*: All official correspondence between UNT and students is conducted via Eagle Connect and it is the student's responsibility to read their Eagle Connect Email regularly.

*Cell Phones and Laptops:* Students should turn off cell phones when they are in class unless the phones are being used for learning activities associated with the course. Similarly, laptops should be turned off, unless they are being used to take class notes and/or participate in class activities.

*SPOT:* The Student Perceptions of Teaching (SPOT) is expected for all organized classes at UNT. This brief online survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SPOT to be an important part of your participation in this class.

*Collection of Student Work*: In order to monitor students' achievement, improve instructional programs, and publish research findings, the Department of Teacher Education and Administration collects anonymous student work samples, student demographic information, test scores, and GPAs to be analyzed by internal and external reviewers.

*Foliotek e-Portfolio*. Foliotek is a free to you software data management system (MMS) used in the assessment of your knowledge, skills, and dispositions relevant to program standards and objectives. You will be required to use your Foliotek account for the duration of your enrollment in the College of Education in order to upload required applications, course assignments, and other electronic evidence/evaluations as required. This course may require assignment(s) to be uploaded and graded in Foliotek. The college of Education will track your progress in your program through this data to verify that you have successfully met the competencies required in your program of study. All students must register in the program portfolio that aligns with their degree plan. Registration codes and tutorials can be found on this site: <https://www.coe.unt.edu/office-educator-preparation/foliotek>.

*Comprehensive Arts Program Policy.* The Elementary Education program area supports a comprehensive arts program to assist preservice and inservice teachers to design and implement curricular and instructional activities which infuse all areas of the arts (visual, music, theater, and movement) throughout the elementary and middle school curriculum.

*Technology Integration Policy.* The Elementary, Secondary, and Curriculum & Instruction program areas support technology integration to assist preservice and inservice teachers to design and implement curricular and instruction activities which infuse technology throughout the K-12 curriculum.

*TExES Test Preparation*. To meet state requirements for providing 6 hours of test preparation for teacher certification candidates, the UNT TExES Advising Office (TAO) administers the College of Education TExES Practice Exams. Students who want to take a practice exam should contact the TAO (Matthews Hall 103). Students may take up to *two exams* per session that relate to their teaching track/field at UNT. Students should also plan accordingly, as they are required to stay for the entire testing period. Current students must meet the following criteria in order to sit for the TExES practice exams: Students must (1) be admitted to Teacher Education, (2) have a certification plan on file with the COE Student Advising Office, and (3) be enrolled in coursework for the current semester. For TExES practice exam information and registration, go to: <http://www.coe.unt.edu/texes-advising-office/texes-exams>. If you need special testing accommodations, please contact the TAO at 940-369-8601or e-mail the TAO at [coe-tao@unt.edu](mailto:coe-tao@unt.edu). The TAO website is [www.coe.unt.edu/texes](http://www.coe.unt.edu/texes). Additional test preparation materials (i.e. Study Guides for the TExES) are available at [www.texes.ets.org](http://www.texes.ets.org).

*“Ready to Test” Criteria for Teacher Certification Candidates*. Teacher certification candidates should take the TExES exams relating to their respective certification tracks/teaching fields during their early-field-experience semester (i.e. the long semester or summer session immediately prior to student teaching).

*Six Student Success Messages.* The Department of Teacher Education & Administration supports the six student success messages on how to succeed at UNT: (1) Show up; (2) Find support; (3) Get advised; (4) Be prepared; (5) Get involved; and (6) Stay focused. Students are encouraged to access the following website: <https://success.unt.edu>. The site contains multiple student resource links and short videos with student messages.

**Attendance: Class participation and attendance will be considered in assigning the final course grade (2 absences = drop 1 letter grade); 3 or more absences = F for the course).**

**All Late Assignments Will Be Awarded Zero Points.**

**\*\*\*\*\*ALL assignments MUST be completed to earn an A in the course. Even if your points total to a number within the “A” range, if an assignment is missing, you will earn a grade of “B “.**

**Assignments to be uploaded into FOLIOTEK must be uploaded as per due date. Any FOLIOTEK Assignment not loaded into FOLIOTEK WILL BE AWARDED ZERO POINTS EVEN IF YOU PROVIDED THE COURSE INSTRUCTOR WITH A HARDCOPY OF THE ASSIGNMENT.**

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| **Week** | **Class Meeting**  **Thursdays** | **Topic/Lecture/Activity/Assignments Due Dates** |
| 1 | 1/16/2020 | **1. Course Introduction**  **2. READ:** Syllabus  **3. Review:** Assigned Microteaching Science Lesson Topics  **Topic/Lecture:**   1. Course Introduction: Assignments 2. “My Beliefs” 3. Planning for Science: Lesson Plans and Instructional Strategies:    * Current Trends in Elementary Science Teaching,    * TEKS,    * STEM/NGSS,    * National Science Teachers Association Position Statements, and    * Safety 4. 5E Learning Cycle 5. IRBs and Research   **Activities:**   1. “My Beliefs” 2. Review of **science lesson plans** and **rubric** 3. **Transitions** between phases of the 5E Learning Cycle |
| 2 | 1/23/2020 | **Assigned Readings**  **Please read**   1. Chapter 12: Planning for Science: Instructional Strategies 2. Chapter 1: Locating Your Scientific Self 3. Course Packet Week 2: Research-Based Teaching Strategies for Effective Science Instruction   **Homework Activities 1 to 5 to be completed by Week 3: Monday 09/11/2017** **–**  **Activities:**   1. Answer questions on Chapter 12 and 1 2. Draw an “Elementary School Science Teacher” 3. Draw 4. a “Male Scientist” 5. a “Female Scientist”, & 6. “Teacher as Scientist” 7. Draw an “Elementary School Science Teacher” teaching in an **informal setting** 8. Briefly describe **EACH** drawing in 10 sentences **specifically,** **describe** the products, and **describe** the processes in each drawing 9. Microteaching I: My Plan |
| 3 | 1/30/2020 | **Engage (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 2: Teachers and Students as Science Learners 2. Course packet Week 3   **Topic/Lecture:**   1. How to generate interest and curiosity 2. How to assess current knowledge, including misconceptions 3. How to raise questions   **Activities:**   1. My Science Notebook 2. Identifying Alternative Conceptions 3. Driving questions and transitions   **Assignments Due: Safety Quiz** |
| **Week** | **Class Meeting**  **Thursdays** | **Topic/Lecture/Activity/Assignments Due Dates** |
| 4 | 2/6/2020 | **Engage (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 13: What’s the Big Idea? Assessing for Understanding 2. Course packet Week 4   **Topic/Lecture:**  **Activities:**   1. Diagnostic, Formative, & Summative Assessments in Science Lesson Plans 2. Using Diagnostic, Formative, & Summative Assessments Effectively |
| 5 | 2/13/2020 | **Explore (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 3: Engaging Students in Science and Engineering Practices   **Topic/Lecture:**   1. How to provide time for students to work together 2. How to observe and listen to students as they interact 3. How to ask probing questions to redirect students’ investigations when necessary 4. Safety in the Elementary Science Classroom   **Activities:**   1. Variables and “Fair Tests” 2. Dissolving and Density 3. Integrating scientific practices in science lessons |
| 6 | 2/20/2020 | **Explore (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 8: Using Models and Engineering Design for Teaching and Learning Science 2. Chapter 10: Content and Curriculum: Science Concepts and Your Scientific Self   **Topic/Lecture:**   1. STEM 2. Scientific practices   **Activities:**   * **Designing/Building/Using models in science instruction**   **Assignments Due:**  **Concept Maps and Draft Physical Science Lesson Plan** |

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| **Week** | **Class Meeting**  **Thursdays** | **Topic/Lecture/Activity/Assignments Due Dates** |
| 7 | 2/27/2020 | **Explain (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 5: Exploring Properties of Matter: Messing Around with Everyday Materials 2. Chapter 6: Plants and Animals and Extended Investigations   **Topic/Lecture:**   1. How to ask for evidence and clarification from students 2. How to use students’ previous experiences as a basis for explaining concepts 3. How to encourage students to explain concepts and definitions in their own words, and then provide scientific explanations and vocabulary   **Activities:**   * Designing and implementing lectures and direct instruction to explain science content |
| 8 | 3/5/2020 | **Explain (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 7: Physical Science Explorations: Density and its Implications 2. Chapter 9: Beyond the Science Kit   **Topic/Lecture:**   1. How to ask for evidence and clarification from students 2. How to use students’ previous experiences as a basis for explaining concepts 3. How to encourage students to explain concepts and definition sin their own words, then provides scientific explanations and vocabulary   **Activities:**   * Designing and implementing lectures and direct instruction to explain science content |
| 9 | 3/19/2020 | **Elaborate (+ Evaluate)**  **Assigned Readings**  **Please read**   1. Chapter 11: Surrounded by Science: Making Science Connections across Disciplines 2. Chapter 4: Taking Science Outside the Classroom: Scientific Explorations in the Local Environment   **Topic/Lecture:**   1. How to design/plan activities for students to apply scientific concepts, skills, and vocabulary to new situations 2. How to resolve conflicts between students’ alternative explanations and universally accepted scientific knowledge   **Activities:**   1. Effective K-12 Informal Science Instructional Strategies 2. Draw an “Elementary School Science Teacher” teaching in an informal setting 3. Review: Compare and Contrast |

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| **Week** | **Class Meeting**  **Mondays** | **Topic/Lecture/Activity/Assignments Due Dates** |
| 10 | 3/26/2020 | **Microteaching:** Lesson Presentation 4 Students  **Physical Science Plan Due** |
| 11 | 4/2/2020 | **Microteaching:** Lesson Presentation 4 Students  **Life Science Plan Due** |
| 12 | 4/9/2020 | **Microteaching:** Lesson Presentation 4 Students  **Earth Science Plan due** |
| 13 | 4/16/2020 | Online Activity TBA |
| 14 | 4/23/2020 | **Microteaching:** Lesson Presentation 4 Students |
| 15 | 4/30/2020 | **Final Review** |
| 16 | 5/7//2020 | **Final Exam (Tentative)**  **Assignments Due:**  **Microteaching Self Reflection DUE - on CANVAS** |

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|  | ***Assignments*** | **Due Dates** | **Points** | **Grading**  Course grade matrix: (for assigning final course grades)  100% – 90% = A,  89% – 80% = B,  79% – 70% = C,  69% – 60% = D,  below 60% = F |
|  | Class attendance: Participation & Professionalism. (*Microteaching Sessions count double*) |  | **65** |
|  | Safety Quiz | 1/30/2020 | **35** |  |
|  | Draft Microteaching Lesson Plan –  Upload to Foliotek + Hard Copy to Course Instructor  Must be a Physical Science Lesson Plan  **Lesson Plan *Template in Canvas*** | Thursday  2/20//2020 | **20** |
|  | Concept Maps –  Physical Science Lesson Plan  Life Science Lesson Plan  Earth & Space Science Lesson Plan | Thursday  3/26/2020  4/2/2020  4/9/2020 |  |
| **20** |
| **20** |
| **20** |
|  | Mid-Term Exam (Online)  *Available Online from Monday* 10/24/2018 *to Friday* 10/26/2017 | TBD | **80** |
|  | Microteaching |  | **35** |
|  | Physical Science Lesson Plan  Upload to Foliotek + Hard Copy to Course Instructor  **Lesson Plan *Template in Canvas*** | Thursday  3/26/2020 | **35** |
|  | Life Science Lesson Plan  Upload to Foliotek + Hard Copy to Course Instructor  **Lesson Plan *Template in Canvas*** | Thursday  4/2/2020 | **35** |
|  | Earth & Space Science Lesson Plan  Upload to Foliotek + Hard Copy to Course Instructor  **Lesson Plan *Template in Canvas*** | Thursday  4/9/2020 | **35** |
|  | Microteaching Self-Reflection  Hard Copy to Course Instructor | Thursday  5/7/2020 | **25** |
|  | Final Exam | TBD | **100** |
|  | Science Notebook |  | **60** |
|  |  | **Total** | **600** |
|  |  | **Percentage** | ***100%*** |  |

**Course Assignments**

Please see specific instructions for formatting and submittal information.

1. Participation and Professionalism – CRITICAL!
2. Completes assigned readings before coming to class
3. Answers questions and participates in class discussions
4. Avoid social or unrelated conversation, working on other assignments, using cell phone, checking email, surfing web, playing video games during class time etc.
5. Weekly Activities – Readings and other activities that are assigned weekly throughout the semester.
6. Integrating Reflections – Reflective writings that serve to integrate your experiences during the semester.
7. Science Lesson Presentation – Content teaching in the methods classroom using the 5E model. Includes the following: Presentation, Hands-on activity, Visual Organizer, Extension activity, Formative and Summative Assessments, Administration and Arts Integration (e.g., scientific illustration, using science trade books [language arts literacy]), dramatic performance [skits/historical science leader role play], and music.

**Class Attendance: Participation & Professionalism**

**Active Participation Grade Rubric**:

A participation grade is given to you each day of class. **All** classes are mandatory. Only exceptions are given if approval has been given to be out in the schools during a *Lesson Planning Date.*

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| --- | --- | --- | --- |
| **Points** | **Attendance** | **Preparedness** | **Participation** |
| **15** | Present and Prompt. | \*Has clearly read the reading assignments prior to class; has reflected upon them and is prepared to discuss them. | In small and large group discussions, participates frequently and appropriately. Comments are insightful and contribute positively to the discussion. Respects and listens to the perspectives and ideas of classmates. |
| **10** | Arrives within the 10 minutes of class. | Has clearly read the reading assignments prior to class; has reflected upon them and or is moderately prepared to discuss them. | In small and large group discussions, sometimes participates, and participations is generally appropriate. Comments are sometimes insightful and contribute positively to the discussion. Generally, though, not always respects and listens to the perspectives and ideas of classmates. |
| **5** | More than 10 minutes late to class | Has skimmed the reading assignments or has not read them and is clearly unprepared to discuss them. | Does not participate in class discussions, or participation is inappropriate. Comments are off-topic or otherwise do not contribute positively to class discussion. |
| **0** | Absent from class |  | |

**Lesson Plan Assignments**

3 Lesson Plans + 1 Draft Lesson Plan

For this course you will design three lesson plans – a Physical Science Lesson Plan, a Life Science Lesson Plan and an Earth & Space Science Lesson Plan.

The Draft Microteaching Lesson Plan and the Microteaching Lesson Plan & Presentation must be a Physical Science Lesson.

Both the Draft Microteaching Lesson Plan and Microteaching Lesson Plan must be uploaded to FOLIOTEK, and a hard copy handed in to the Course Instructor in class.

You will microteach this lesson plan during the scheduled **Microteaching Lesson Plan & Presentation**

**Your Microteaching session must be 30 minutes long.**

**Format for Microteach**

1. **State/List Learning and Language Objectives – PowerPoint/BlackBoard**
2. ***Most Importantly: Safety Measures must be addressed before lesson starts.***
3. **Address Special Needs Modifications**
4. ***You will only carry out Engage, Explore and Explain = TEACHING.***
5. ***Evaluation is throughout the lesson.***

**Must include a Summative Assessment with Rubrics that you will collect and grade as Homework**

1. **Microteaching Lesson Plan & Presentation: Physical Science Lesson Plan**
   * Upload to FOLIOTEK + Hard Copy to Course Instructor
2. **Life Science Lesson Plan**
   * Upload to FOLIOTEK + Hard Copy to Course Instructor
3. **Earth & Space Science Lesson Plan**
   * Upload to Foliotek + Hard Copy to Course Instructor

**Lesson Plan Template**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Teacher:** | | **Date:** | **District:** | **School:** | |
| **Subject: Please List** | | **Grade Level: Please List** | **Unit Title: Please List** | **Lesson Title: Please List** | |
| **Relevant TEKS** | | | | | |
| **List the appropriate TEKS** | | | | | |
| **Science Content (Big Ideas: Definitions, Facts, Process/Integrated Skills, Explanations, etc.)** | | | | | |
| **List the Science Content only.** | | | | | |
| **Learning Objective(s):** | | | | | |
| **Make sure the objectives are measurable.**  **At least 3 objectives must be listed.** | | | | | |
| **Relevant ELPS - Language Objective(s):** | | | | | |
| **Must include the following actions: reading, writing listening, speaking** | | | | | |
| **Relevant TX CCRS:** | | | | | |
| **Must include the relevant TX CCRS.** | | | | | |
| **Assessments:** | | | | | |
| **Diagnostic Assessment/s: List the name/s of the diagnostic assessment/s.**  **Formative Assessments: List the name/s of the formative assessment/s.**  **Summative Assessment: List the name of the summative assessment and include a rubric (*please include the Rubric in the Evaluate section of the lesson plan*)** | | | | | |
| **5E Learning Cycle:** | | | | | |
| **Engage** | **Must assess students’ prior knowledge.** | | | | ***Safety Rules and Regulations must be listed when and/or where appropriate within the 5 phases*** |
| **Explore** | **Must include an inquiry activity.** | | | |
| **Explain** | **Must include Students’ Explain Activity.**  **Must include Teacher Explanation (Lectures/Direct Instruction must include PowerPoint Slides; Concept Maps, etc.).** | | | |
| **Elaborate** | **Must include an activity/activities within which students will apply their constructed science knowledge**. | | | |
| **Evaluate** | **Must include a summative assessment with rubrics/answer scheme, etc.** | | | |
| **Language Modification(s):** | | | | | |
| **Must relate to ELPS.**  **List the ELL strategies: Word Wall, etc.** | | | | | |
| **Diversity and Equity (Accommodations, Modifications, Adaptations)** | | | | | |
| **Must list the appropriate accommodation, modifications, adaptations in relation to Diversity and Equity** | | | | | |
| **Materials and Resources:** | | | | | |
| **List all materials.**  **Include safety concerns, when needed.** | | | | | |
| **Technology:** | | | | | |
| **List appropriate NETS for Teachers and Students.** | | | | | |

***Science Lesson Plan Rubric***

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| **Criterion** | **Absent (0)** | **Unsatisfactory (1)** | **Developing (2)** | **Target (3)** | **Outstanding (4/5)** |
| Ideas and indicators | Big idea, TEKS, **learning objectives, language objectives**, or align lesson with TEKS is missing | Missing three or more of the following components: “big idea” display of TEKS, **learning objectives, language objectives**, and alignment of lesson with TEKS. | Missing two of the following components: big idea” display of TEKS, **learning objectives, language objectives**, and alignment of lesson with TEKS. | Missing one of the following components: big idea” display of TEKS, **learning objectives, language objectives**, and alignment of lesson with TEKS. | Identifies big idea” display of TEKS, **learning objectives, language objectives**, and lesson is aligned with TEKS. |
| Safety Rules and Regulations | Safety Rules and Regulations are missing. | Includes and lists Safety Rules and Regulations but are inappropriate. | Includes and lists Safety Rules and Regulations when and/or where appropriate within the 5 phases but **does not** **describe** and **explain** Safety Rules and Regulations. | Includes, lists and describes Safety Rules and Regulations when and/or where appropriate within the 5 phases but **does not explain** Safety Rules and Regulations. | **Includes, lists, describes and explains** Safety Rules and Regulations when and/or where appropriate within the 5 phases. |
| Engage | Engage is missing. | Missing three or more of the following components: captures students’ attention (e.g., discrepant events or questions); assesses prior knowledge and misconceptions; and connects to appropriate Explore student activities. | Missing two of the following components: captures students’ attention (e.g., discrepant events or questions); assesses prior knowledge and misconceptions; and connects to appropriate Explore student activities. | Missing one of the following components: captures students’ attention (e.g., discrepant events or questions); assesses prior knowledge and misconceptions; and connects to appropriate Explore student activities. | Addresses all components: captures students’ attention (e.g., discrepant events or questions); assesses prior knowledge and misconceptions; and connects to appropriate Explore student activities. |
| Explore | Explore is missing. | Uses direct concrete experience with the concept Missing three or more of the following components: student centered, teacher acts as a guide, lesson involves a least 50% student interaction, Explore includes enough explanation (e.g., worksheet, lab) to enable students to navigate the Explore independently, lesson is inquiry based and includes pre-instructional and probing questions. | Uses direct concrete experience with the concept Missing two of the following components: student centered, teacher acts as a guide, lesson involves a least 50% student interaction, Explore includes enough explanation (e.g., worksheet, lab) to enable students to navigate the Explore independently, lesson is inquiry based and includes pre-instructional and probing questions. | Uses direct concrete experience with the concept Missing one of the following components: student centered, teacher acts as a guide, lesson involves a least 50% student interaction, Explore includes enough explanation (e.g., worksheet, lab) to enable students to navigate the Explore independently, lesson is inquiry based and includes pre-instructional and probing questions. | Addresses all component: student centered, teacher as guide, interactive, Explore includes enough explanation (e.g., worksheet, lab) to enable students to navigate the Explore independently, inquiry based including probing questions, direct concrete experience with the concept. |

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| **Criterion** | **Absent (0)** | **Unsatisfactory (1)** | **Developing (2)** | **Target (3)** | **Outstanding (4/5)** |
| Explain | Explain is missing. | Teacher clarifies information and shares scientific concept. Missing three or more of the following components: information from Explore is analyzed, concept map is appropriate, a list of essential questions with answer key, teacher clarifies information and shares scientific concept, teacher listens critically to explanation from students, and teacher uses recorded observations from students during explanation. | Teacher clarifies information and shares scientific concept. Missing two of the following components: information from Explore is analyzed, concept map is appropriate, a list of essential questions with answer key, teacher clarifies information and shares scientific concept, teacher listens critically to explanation from students, and teacher uses recorded observations from students during explanation. | Students explain concept using Explore and teacher and students interact during the Explain. Missing one of the following components: information from Explore is analyzed, concept map is appropriate, a list of essential questions with answer key, teacher clarifies information and shares scientific concept, teacher listens critically to explanation from students, and teacher uses recorded observations from students during explanation. | Addresses all components: students explain concept using Explore, teacher and students interact during Explain, information from Explore is analyzed, concept map is appropriate, a list of essential questions with answer key, teacher clarifies information and shares scientific concept, teacher listens critically to explanation from students, and teacher uses recorded observations from students during explanation. |
| Elaborate | Elaborate is missing. | Missing three or more of the following components: student centered, activities or deepen understanding OR apply concept to a real world situation. | Missing two of the following components: student centered, activities or deepen understanding OR apply concept to a real world situation. | Missing one of the following components: student centered, activities or deepen understanding OR apply concept to a real world situation. | Addresses all components: student centered, activities or deepen understanding OR apply concept to a real world situation. |
| Evaluate | Evaluate is missing. | Missing three or more of the following components: Appropriate preplanned assessment with answer key is used (i.e., diagnostic and formative assessment). Teacher adjusts instruction for student learning and concept development, students reflect on learning at least twice during the lesson. | Missing two of the following components: Appropriate preplanned assessment with answer key is used (i.e., diagnostic and formative assessment). Teacher adjusts instruction for student learning and concept development, students reflect on learning at least twice during the lesson. | Missing one of the following components: Appropriate preplanned assessment with answer key is used (i.e., diagnostic and formative assessment). Teacher adjusts instruction for student learning and concept development, students reflect on learning at least twice during the lesson. | Appropriate preplanned assessment with answer key is used (i.e., diagnostic and formative assessment). Teacher adjusts instruction for student learning and concept development, students reflect on learning at least twice during the lesson. |

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| **Total Score**  **(35 points)** |  |

***MICROTEACHING SELF-REFLECTION***

**Use the comments from the Peer Evaluations of your Microteaching Lesson to write your Microteaching Self-Reflection**

1. **Pre-Instruction Reflection**

*[Write an introductory paragraph that briefly summarizes your lesson.*

*This paragraph will include the following:*

1. *The purpose of the lesson*
2. *The learning objectives and language objectives*
3. *Connections to standards/TEKS*
4. *Which parts of the lesson led to engagement and student learning*
5. *The Science Content – the Big Ideas/Concepts]*
6. **Action Phase of Teaching**

*[A response to the question “Which parts of the lesson led to engagement and student learning?”]*

1. **Post-Instruction Reflection**

**My Teaching Strength**

*[Respond to:*

1. ***Describe*** *one strength of your teaching/lesson with evidence respectively*
2. *How did your teaching help your students construct the science content you taught]*

**My Teaching Weakness**

***[Describe*** *one weakness of your teaching/lesson with evidence respectively.]*

**Improvements**

*[A response to the question “How can I increase student learning, engagement, etc. next time I teach this lesson”]*

**Conclusion**

*[The* ***Conclusion*** *must include the following:*

*Respond to:*

1. *“What did you learn from teaching this lesson that can apply to other lessons?”*
2. *Details of at least 2 teaching suggestions to improve the lesson you taught in class.]*

***Rubric: Microteaching Self-Reflection***

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **0** | **5** | **10** | **15** | **20** |
| Missing three of the following elements:   1. **Pre-Instruction Reflection;** 2. **Action Phase of Teaching;** 3. **Post-Instruction Reflection** \*(post- instruction reflection using peer feedback and personal reflection). | Missing two of the following elements:   1. **Pre-Instruction Reflection;** 2. **Action Phase of Teaching;** 3. **Post-Instruction Reflection** \*(post- instruction reflection using peer feedback and personal reflection). | Missing one of the following elements:   1. **Pre-Instruction Reflection;** 2. **Action Phase of Teaching;** 3. **Post-Instruction Reflection** \*(post- instruction reflection using peer feedback and personal reflection). | All of the following elements are present but lack sufficient detail and support (evidence) using peer feedback, personal reflection, and lesson plan components:   1. **Pre-Instruction Reflection;** 2. **Action Phase of Teaching;** 3. **Post-Instruction Reflection** \*(post- instruction reflection using peer feedback and personal reflection). | All of the following elements are clearly detailed, elaborated, and supported (evidence) using peer feedback, personal reflection, and lesson plan components.   1. **Pre-Instruction Reflection;** 2. **Action Phase of Teaching;** 3. **Post-Instruction Reflection** \*(post- instruction reflection using peer feedback and personal reflection). |

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| **0** |  | **5** |
| Writing is incoherent with a number of grammatical errors. | Writing is coherent with no grammatical errors. |

|  |  |  |
| --- | --- | --- |
|  | **Total (25 points)** |  |