University of North Texas at Dallas
School of Education

Syllabus for EDUC 4330, Fall 2025
Teaching Science EC-8

Department of Teacher Education and Administration	**School of Education**

Instructor Name:	**Dr. Ratna Narayan**
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Office Hours:	**Wed 1-3 pm, Thur 3:00-5:00 pm, Sat 10am- 2 pm via zoom/ phone**
Classroom Location:	TBA
Class Meeting Days & Times:	**Thursday, 5:30pm – 8:30 pm**
Course Catalog description	This course will explore the pedagogical techniques, instructional methods and materials needed for teaching science in the K-8 grades. Emphasis will be laid on hands-on activities, scientific inquiry and standards-based teaching and learning.
Prerequisites:	Acceptance into the UNTD SOE Teacher Education Program.
Required Text:	**Readings from the NSTA position statements: https://www.nsta.org/nstas-official-positions**
Technology Requirements	**Please bring a laptop/ ipad to every class**

Additional Learning Resources:	UNT Dallas Library: phone: (972) 780-1616 web: http://www.untdallas.edu/library email: library@untdallas.edu UNT Dallas Bookstore: phone: (972) 780-3652 web: http://www.untdallas.edu/bookstore e-mail: untdallas@bkstr.com

Course Goals or Overview: The goals of this course are as follows -

The goal of this course is to provide teacher candidates with the knowledge, skills, and dispositions as a basis for making decisions in respect to teaching elementary/middle school science.

The knowledge, skills and dispositions developed in this course are delineated in a variety of ways, including student learning outcomes, assessments, assignments, and various course activities. They are also developed in a manner consistent with recommendations of the National Research Council's National Science Education (NSES) and National Science Teachers Association (NSTA) Standards, and the requirements of the Texas State Board for Educator Certification (TEKS).

Learning Objectives/Outcomes: At the end of this course, students will be able to:

SLO 1	Students will articulate, develop, and refine personal understandings of science and science teaching **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard IV**
SLO 2	Students will use reflective analysis to improve their teaching. **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard IV**
SLO 3	Students will demonstrate their understanding of the nature of science and science process skills (basic & integrated) **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard VI**
SLO 4	Students will demonstrate their understanding of the science TEKS, vertical alignment of the science content, & correlation to the National Science Education Standards (NSES) **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standards, VII, IX, X**
SLO 5	Students will demonstrate their understanding of managing safety issues to promote science learning in the lab, field and in the classroom **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standards I, II**
SLO 6	Students will apply their understanding of the scientific method to design and conduct a science fair project with a testable hypothesis and variables **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard IV**
SLO 7	Students will learn about the role and types of scientific inquiry and design and teach inquiry-based science activities and lessons **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard III**
SLO 8	Students will be able to demonstrate the use of instructional strategies and teaching activities to teach the science content knowledge included in the TEKS in laboratory, and classroom settings. **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard IV**
SLO 9	Students will learn about the use of formal and informal assessments relevant to science instruction at the elementary / middle school level laboratory, field (outside), and classroom settings **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard V**
SLO 10	Students will construct science lessons and hands-on experiences that address the needs of a variety of student populations including English language learner, special needs students, and gifted and talented students **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard IV**
SLO 11	Students will identify and explain the recurring themes and unifying concepts at the elementary / middle school level and relate how these components relate to each other and the environment **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard XI**
SLO 12	Students will develop an understanding of controversial issues in science and their relevance to social ethics **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standard VII**
SLO 13	Students learn about the contribution of diverse scientists and their impact on society and STEM careers **TExES Core Subjects, EC-6 Science, TExES 4-8 Science, Standards VI, VII**

Suggested Course Outline

This schedule is subject to change by the instructor. Any changes to this schedule will be communicated in class or via class email or Canvas announcement. Additional readings and activities may be added; these will be noted in the Readings and Activities/Assignments sections.

Week	Topic	Suggested Assessments
1 Aug 28th	What is science, science process skills, relevance of science to everyday life Draw a Scientist test in class Details about CAST	*Assessments:* Pre reflection due Aug 28th
2 Sept 4th	Nature of Science and Science Process skills The Science TEKS	*Assessments:* Science in your everyday life assignment due sept 9th
3 Sept 11th	**IN CLASS Workday** on CAST and the Lower elem activity presentation	*Assessment:* Reflection 1: the Science TEKS and me due Sept 14th All documents pertinent to the Lower elem science activity presentation due Sept 18th
4 Sept 18th	Lower elem science activity presentation	Reflections on your lower elem science activity presentation due sept 28th
5 Sept 25th	Safety in the lab, field, and classroom https://www.nsta.org/nstas-official-positions/safety-and-school-science-instruction Bring draw a scientist responses to class from school placement	*Assessment:* Safety in the classroom assignment due Oct 5th
6 Oct 2nd	Scientific inquiry and its implementation in Elementary /middle school Classroom https://www.nsta.org/nstas-official-positions/learning-science-informal-environments Work on CAST presentations	*Assessments::* Reflection: Scientific Inquiry and me due Oct 12th
7 Oct 9th	Recurring themes and concepts in Life science Life science presentation (do not choose adaptation)	*Assessments:* Life science presentation, Adaptation Assignment relation between structure and function and reflection Due Oct 19th

8 Oct 16th	Work day	*Assessment:* *Catch up on assignments*
9 Oct 23rd	Recurring themes and concepts in Earth science Earth science presentation	*Assessments:* Water cycle assignment and reflection due Oct 26th
10 Oct 30th	CAST Practice and Feedback session	*Assessments:*
11 Nov 6th	Physical science Models	
12 Nov 13th	CAST No Class	*Assessments:* Physical Science reflection due Nov 13th
13 Nov 20th	STEM/ STEAM presentation	School assignments due Dec 1st
Week 14 Nov 27Thanksgiving		
15 Dec 4th	Last day of class POTLUCK	*Assessments:* STEM Assignment due Dec 4th
	Final Reflection and CAST reflection	Due Dec 8th

Course Evaluation Methods
This course will utilize the following instruments to determine student grades and proficiency of the learning outcomes for the course. Details of each assignment and the grading scheme are on the respective canvas assignments.

Please respond to all assignments in paragraph form. No single line responses will be accepted. If your response is not detailed enough, you will lose points.

Assignments are of two types.
In Class Assignments at UNT Dallas and assignments at the school site you have been assigned to. **NONE of the assignments are optional. Not completing the assignments at the school site will result in failing the course.**

In Class Assignments:

Pre-reflection Assignment: is your science story, a narrative which will give me an idea regarding your thoughts and experiences with science teaching and learning. 10 points

Science in your house and surroundings: The purpose of this assignment is to define science/ STEM and identify examples of science/ STEM in your house and surroundings. This assignment calls for you to take 15 pics at 3 different locations and tell me how it is an example of science/STEM. 20 points

Lower Elementary Science Lesson: you will design and teach a science content lesson for a lower elementary grade to your peers. You will submit your lesson plan, teach your lesson to your peers, and reflect on your presentation. You will also participate as students in your peers' lessons and provide constructive feedback to them. 100 points Major assignment

Reflection 1-the new science TEKS and me: In this reflection 20-point reflection, you will explore the changes in the Science Teks that have been implemented from Fall 2024, specifically the addition of phenomena-based learning and the science and engineering practices and their implementation in a K-8 science classroom.

Science Safety Plan of action: In this 45-point major assignment, you will explore different aspects of safety in a K-8 classroom such as science safety rules and rationale, safety plan, safety contracts, MSDS sheets, relevant safety terms and their representation etc.

Scientific Inquiry and me: In this 20-point reflection, you will explain what scientific inquiry is in your own words as well as cite research about it. You will distinguish between cookbook and inquiry-based labs and explore the inquiry continuum and the types of inquiry that feature on it.

Earth/ Physical Science Presentations and discussion: You will engage your peers in a hands-on, grade relevant Life/ Earth/ Physical Science Presentation followed by discussion questions regarding the content, pedagogy, relevance to real life (70, 50 AND 40 points)

STEM presentation and reflection: For this 30-point assignment you will present your perceptions of STEM and its application in the K-8 classroom and the real world. You will also reflect on your presentation and those of your peers.

Final reflection: 35 points. Yu will reflect on what you have learned about science teaching and learning in this class and at the school site

CAST activities and Reflection 30 points

Explore.org assignment: this is in lieu of the life science presentation or reflection. Please see Canvas for details 70 point assessment

School site assignments:
These are assignments you will complete at your school site with your students. They include:
Draw a scientist test responses and analysis 10 points
Science lesson observation: 20 points
Science Hands-on activity: 20 points

In Class Assignments at UNT Dallas	Points
Pre-Reflection	10 points
Science in your house and surroundings	20 points
Lower elementary lesson plan	100 points
Reflection 1: The Science TEKS and me	20 points
Science Safety Assignment	45 points
Reflection 2: Scientific Inquiry and me	20 Points
Explore.org Presentation and reflection	70points
Earth Science Presentation and reflection	50 points
Designing a working science model of a Physical science concept and reflection	40 points
STEM assignment and presentation	30 points
Final Reflection	35 points
CAST activity and reflection	30 points
Assignments at the school site Mandatory	
Draw a scientist test responses and analysis	20 points
Science Lesson Observation	20 points
Hands on science activity	30 points

Attendance and Participation	130 points
Total	**670 points**
Extra Credit class evals	10 points
Scientist from around the world	5 points
STEM/ Extra credit	15 points
Grand Total	**670 points**

Extra credit opportunities will be provided, and extra credit points will be added to the total
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GRADE DETERMINATION:
A = 90% or better
B = 80 – 89 %
C = 70 – 79 %
D = 60 – 69 %
F = less than 60%

Late Assignments:

- Coursework is expected to be submitted on time.
- **There will be a 10% reduction of the assignment grade for every day the assignment is late. For example: You score 100% on an assignment. It is three days late. The score is reduced by 30%. You receive 70%.**
- **Assignments more than 5 days late will not be accepted, and you will receive a 0% on that assignment.**
- Life happens! If you have extenuating circumstances, please contact Dr. Narayan asap so we can create a plan for you.

Attendance and Participation:

- **Each class session is worth 10 points. If you are absent, you cannot participate and therefore, you cannot earn your attendance and participation points (EXCUSED OR UNEXCUSED).**

Excused absences are ONLY supported with medical documentation UNLESS university sanctioned. Must include date/time of doctor or hospital visit, stating it is an excuse from school/work. Only original documents will be accepted. Excused absences merit a 5-day extension of assignments but are subject to reconsideration on an individual basis. **Medical excuses must be presented within ONE week of the absence to be honored.**

- Excessive absences are subject to reduction of final grade**. Two unexcused absences will result in your final letter grade being dropped by one letter regardless of your overall points.** Four absences will result in your overall grade being dropped by 2 letter grades and so on extension of assignments but are subject to reconsideration on an individual basis.
- **If you are more than 10 minutes late to class, you will not receive full points for attendance and risk being marked absent.**
- Engaging in activities/discussions unrelated to the topic at hand, and/or excessive use of technologies in excess may result in a reduction of participation points.

Attendance in Canvas is recorded as a %, I will keep a record of absenteeism and then convert to points at the time of final grading (10 points per class you were present for x no of classes)

Life Happens Clause:

- If due to unusual circumstances such as an extended illness, the student misses more than two sessions, he/she should contact the instructor to see if additional makeup assignments can be obtained and completed.
- Please inform me in advance of any excused absences you may have in compliance with the University of North Texas Dallas.

University Policies and Procedures

Students with Disabilities (ADA Compliance):
Chapter 7(7.004) Disability Accommodations for Students:

The University of North Texas at Dallas makes reasonable academic accommodation for students with disabilities. Students seeking accommodation must first register with the Disability Services Office (DSO) to verify their eligibility. If a disability is verified, the DSO will provide you with an accommodation letter to be delivered to faculty to begin a private discussion regarding your specific needs in a course. You may request accommodations at any time, however, DSO notices of 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 accommodation for every semester and must meet/communicate with each faculty member prior to implementation in each class. Students are strongly encouraged to deliver letters of 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 see Disability Services Office. You may also contact them by phone at 972-338-1777; by email at UNTDdisability@untdallas.edu or at Building PL, room 1104.

Disruptive Behavior in an Instructional Setting:

Students are expected to engage with the instructor and other students in this class in a respectful and civil manner at all times to promote a classroom environment that is conducive to teaching and learning. Students who engage in disruptive behavior will be directed to leave the classroom. A student who is directed to leave class due to disruptive behavior is not permitted to return to class until the student meets with a representative from the Dean of Students Office. It is the student's responsibility to meet with the Dean of Students before class meets again and to provide the instructor confirmation of the meeting. A student who is directed to leave class will be assigned an unexcused absence for that class period and any other classes the student misses as a result of not meeting with the Dean of Students. The student is responsible for material missed during all absences and the instructor is not responsible for providing missing material. In addition, the student will be assigned a failing grade for assignments, quizzes or examinations missed and will not be allowed to make up the work.

The Code of Student's Rights, Responsibilities, and Conduct (Policy 7.001) describes disruption as the obstructing or interfering with university functions or activity, including any behavior that interferes with students, faculty, or staff access to an appropriate educational environment. Examples of disruptive behavior that may result in a student being directed to leave the classroom include but are not limited to: failure to comply with reasonable directive of University officials, action or combination of actions that unreasonably interfere with, hinder, obstruct, or prevents the right of others to freely participate, threatening, assaulting, or causing harm to oneself or to another, uttering any words or performing any acts that cause physical injury, or threaten any individual, or interfere with any individual's rightful actions, and harassment. You are encouraged to read the Code of Student's Rights, Responsibilities, and Conduct for more information related to behaviors that could be considered disruptive.

Sexual Harassment, Sexual Misconduct, Intimate Partner Violence and Stalking
UNT Dallas is committed to creating a safe learning environment for all members of our community, free from gender and sex-based discrimination, including sexual harassment, domestic and dating violence, sexual assault, and stalking, in accordance with Title IX, Texas laws and University Policies. Please note that all employees are mandated reporters and must report all instances of sexual misconduct, dating violence, sexual assault, domestic violence and stalking to the Title IX Coordinator. If you or someone you know has experienced any form of sex or gender-based discrimination or violence and wish to speak to the Title IX Coordinator, you can email them at titleix@untdallas.edu or file a report.

Pregnancy, Pregnancy Related Conditions and Parenting Modifications Under Title IX
UNT Dallas is committed to compliance with Title IX, and to supporting the academic success of pregnant and parenting students and students with pregnancy related conditions. If you are a pregnant, have pregnant related

conditions or a parenting student (child under one-year needs documented medical care) who wishes to request reasonable related modifications from the University under Title IX, please email the Title IX Coordinator at titleix@untdallas.edu The Title IX Coordinator will work with your professors and academic unit to provide reasonable modifications needed to be supportive of your education while pregnant or as a parent under Title IX

Canvas Instructure Accessibility Statement:
University of North Texas at Dallas is committed to ensuring its online and hybrid courses are usable by all students and faculty including those with disabilities. If you encounter any difficulties with technologies, please contact our ITSS Department. To better assist them, you would want to have the operating system, web browser and information on any assistive technology being used. Canvas Instructure Accessibility Statement is also provided.

NOTE: Additional instructional technology tools, such as Turnitin, Respondus, Panopto, and publisher cartridge content (i.e. MyLab, Pearson, etc.) may NOT be fully ADA compliant. Please contact our Disability Office should you require additional assistance utilizing any of these tools.

Course Evaluation Policy:
Student's evaluations of teaching effectiveness is a requirement for all organized classes at UNT Dallas. This short 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 students' evaluations to be an important part of your participation in this class.

Assignment Policy: (According to the instructor's discretion while working in concert with the division/program's guidelines).

Exam Policy: (Online exams and the ability to retake is solely at the instructor's discretion). NOTE: Online exams may be proctored on campus per instructor's discretion.

Academic Integrity:
Academic integrity is a hallmark of higher education. You are expected to abide by the University's code of Academic Integrity policy. Any person suspected of academic dishonesty (i.e., cheating or plagiarism) will be handled in accordance with the University's policies and procedures. Refer to UNT Dallas' Student Code of Academic Integrity for complete provisions of this code.

Academic dishonesty includes, but is not limited to, cheating, plagiarizing, fabrication of information or citations, facilitating acts of dishonesty by others, having unauthorized possession of examinations, submitting work of another person or work previously used without informing the instructor, or tampering with the academic work of other students.

Web-based Plagiarism Detection: Please be aware in some online or hybrid courses, students may be required to submit written assignments to Turnitin, a web-based plagiarism detection service, or another method. If submitting to Turnitin, please remove your title page and other personal information.

The use of AI tools for assignments
All work submitted for this course must be your own. Any sole use of generative AI tools when working on assignments is forbidden. Use of generative AI will be considered academic misconduct and subject to investigation. Please cite any instance of AI use and keep a copy of your AI searches.
The assignments in this class have been designed to challenge you to develop creativity, critical-thinking, and problem-solving skills. Only Using AI technology will limit your capacity to develop these skills and to meet the learning goals of this course

Classroom Policies

Online Attendance and Participation:
The University attendance policy is in effect for this course. Class attendance in the Canvas classroom and participation is expected because the class is designed as a shared learning experience, and because essential information not in the textbook will be discussed in the discussion board. Online presence and participation in all class discussions is essential to the integration of course material and your ability to demonstrate proficiency.

Attendance for this online or hybrid course is considered when you are logged in and active in Canvas, i.e., posting assignments, taking quizzes, or completing Discussion Boards. To maintain financial aid award eligibility, activity must occur before the census date of the session or term of the course. Refer to UNT Dallas' Registrar for specific dates. If you are absent/not active in the course shell, it is YOUR responsibility to let the instructor know immediately, upon your return, the reason for your absence if it is to be excused. All instructors must follow university policy 7.005 covering excused absences; however, it is the instructor's discretion, as outlined in the course syllabus, of how unexcused absences may or may not count against successful completion of the course.

Inclement Weather and Online Classes: Online classes may or may not be effected by campus closures due to inclement weather. Unless otherwise notified by your instructor via e-mail, online messaging, or online announcement, students should assume that assignments are due as scheduled.

Online "Netiquette":
In any social interaction, certain rules of etiquette are expected and contribute to more enjoyable and productive communication. Emails, Discussion Board messages and/or any other forms of written communication in the online environment should use proper "netiquette" (i.e., no writing in all caps (usually denotes yelling), no curse words, and no "flaming" messages (angry, personal attacks).

Racial, ethnic, or gender slurs will not be tolerated, nor will pornography of any kind.

Any violation of online netiquette may result in a loss of points or removal from the course and referral to the Dean of Students, including warnings and other sanctions in accordance with the University's policies and procedures. Refer to UNT Dallas Student Code of Conduct. Respect is a given principle in all online communication. Therefore, please be sure to proofread all of your written communication prior to submission.

Diversity/Tolerance Policy:
Students are encouraged to contribute their perspectives and insights to class discussions in the online environment. However, offensive & inappropriate language (swearing) and remarks offensive to others of particular nationalities, ethnic groups, sexual preferences, religious groups, genders, or other ascribed statuses will not be tolerated. Disruptions which violate the Code of Student Conduct will be referred to the Dean of Students as the instructor deems appropriate.

Technology Assistance: In order to successfully access the materials in an online or hybrid course, UNT Dallas advises that your computer be equipped with the minimum system requirements listed on the first page of the syllabus.

If you experience difficulty accessing or using components of the course, try using Google Chrome browser. If you still experience technical difficulties, first, notify your instructor.

If the problem is still not resolved, call Student Assistance (Distance Learning) at the phone number listed on the first page of the syllabus. Also, no matter what browser you use, always enable pop-ups. For more information see:

- UNT Dallas Canvas Technical Requirements

- Canvas Instructure Supported & Unsupported Operating Systems