EDUC 325: Teaching Elementary Science & Health

Term: Fall 2026
Credits: 3.0
Lecture Times & Location: Tuesday & Thursday 8:00–9:15 a.m., Lovell Hall 110
Modality: In-Person

Instructor Information

- **Instructor:** Dr. Carmen Montoya (Assistant Professor of Teacher Education)
- **Email:** cmontoya@university.alkimi.ai
- **Office:** Lovell Hall 128
- **Office Hours:**
  - Wednesday & Friday: 1:30–3:00 p.m. (In person, Lovell Hall 128)
  - Tuesday: 11:00 a.m.–12:00 p.m. (Virtual via Zoom; link posted in Canvas)
  - Also available by appointment.

Course Description

Inquiry-based science instruction, the Next Generation Science Standards, health education, and integrating science with literacy for grades K–6. EDUC 325 prepares elementary teacher candidates to design and implement inquiry-based science and health curricula across kindergarten through grade 6. Grounded in the Next Generation Science Standards (NGSS) and National Health Education Standards (NHES), candidates learn to integrate three-dimensional science learning—Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas—using the 5E instructional model (Engage, Explore, Explain, Elaborate, Evaluate). The course emphasizes anchoring lessons in observable natural phenomena, integrating science notebooks with informational literacy, managing elementary classroom science safety, and promoting lifelong wellness through elementary health education.

Prerequisites

Admission to Teacher Education.

Measurable Student Learning Outcomes

Upon successful completion of EDUC 325, students will be able to:

1. **Implement Three-Dimensional NGSS Learning:** Design elementary science lessons that seamlessly integrate Science and Engineering Practices, Crosscutting Concepts, and Disciplinary Core Ideas around anchoring phenomena.
2. **Apply the 5E Inquiry Instructional Model:** Develop inquiry investigations that follow the 5E model (Engage, Explore, Explain, Elaborate, Evaluate) to foster student-led scientific sense-making and argumentation.
3. **Integrate Science with Disciplinary Literacy and Math:** Incorporate science notebooks, informational trade books, graphical data representation, and structured talk protocols to deepen conceptual literacy.

4. **Design Standards-Based Elementary Health Education:** Develop developmentally appropriate health education lessons addressing nutrition, physical fitness, personal hygiene, emotional wellness, and substance abuse prevention.
5. **Maintain Elementary Laboratory and Field Safety:** Apply legal and professional safety standards (NSTA guidelines) for elementary science investigations, chemical storage, outdoor field studies, and classroom live specimens.

Required Course Materials & Approximate Costs

1. **Contant, Terry L., et al. *Teaching Science Through Inquiry-Based Instruction*. 13th ed., Pearson, 2018.** Approx. $85 print, $50 digital rental.
2. **National Research Council. *A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas*. National Academies Press, 2012.** Approx. $40 print, free open-access PDF via publisher.
3. **Telljohann, Susan K., et al. *Health Education in Elementary and Middle School*. 9th ed., McGraw Hill, 2021.** Approx. $65 print or digital.
4. **Total estimated cost:** $85 to $130.

Generative AI Policy (AI Level 2: AI Permitted with Disclosure for Specified Tasks)

In accordance with Alkimi University Academic Policies (Student Handbook §5.8), EDUC 325 operates under **AI Level 2**.

- **What is permitted:** You may use generative AI tools to brainstorm real-world natural phenomena to anchor science investigations, generate hands-on material alternatives for elementary science experiments, and edit your lesson plan prose for clarity.
- **What is prohibited:** You may not use generative AI to write your 5E inquiry lesson plan, draft the complete integrated science and health unit, fabricate safety protocols, or complete weekly methodology quizzes. The pedagogical alignment of three-dimensional learning must be your own work.
- **Disclosure:** All submitted lesson plans, health teaching plans, and unit portfolios must include an AI disclosure statement stating which generative AI tools were used and for what purpose. If no AI tools were used, state: 'No generative AI tools were used in preparing this work.'

Grading Components and Weights

- **Midterm Examination 1:** 15% (In class, Thursday, October 1)
- **Midterm Examination 2:** 15% (In class, Thursday, November 12)
- **5E Inquiry Science Investigation Design:** 20% (Due Friday, October 23 at 11:59 p.m.)
- **Elementary Health Education Microteaching Simulation:** 15% (Due Friday, November 20 at 11:59 p.m.)
- **Weekly Science & Health Canvas Quizzes:** 15% (Due Mondays at 11:59 p.m. in Canvas; lowest quiz score dropped)
- **Integrated Elementary Science & Health Unit Plan & Portfolio:** 20% (Due by the end of the final exam period, Thursday, December 17, 2026, 10:30 a.m.–12:30 p.m.)

Grading Scale (Alkimi University Standard)

- **A:** 93–100% | **A-:** 90–92%
- **B+:** 87–89% | **B:** 83–86% | **B-:** 80–82%
- **C+:** 77–79% | **C:** 73–76% | **C-:** 70–72%
- **D+:** 67–69% | **D:** 60–66% | **F:** Below 60%
- **Extra credit:** No individual extra credit assignments are offered in EDUC 325.

Course Schedule (Fall 2026)

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 1	Aug 27	**The Nature of Science and Elementary Inquiry:** How children learn science, scientific versus everyday reasoning, inquiry continuum (structured, guided, open), and debunking the rigid 'scientific method'. *Reading: Contant et al., Ch. 1–2; NRC Framework, Ch. 1–2*	*First day of classes: Wed Aug 26.*
Week 2	Sep 1, 3	**The NGSS Framework: Three-Dimensional Learning:** Deconstructing the Next Generation Science Standards: Science & Engineering Practices (SEPs), Crosscutting Concepts (CCCs), and Disciplinary Core Ideas (DCIs). *Reading: NRC Framework, Ch. 3–4; Contant et al., Ch. 3*	*Wed Sep 2: Add/section change deadline.*
Week 3	Sep 8, 10	**Phenomenon-Based Instruction and Anchoring Events:** Selecting compelling, locally relevant natural phenomena; eliciting student prior knowledge, driving question boards, and student initial models. *Reading: Contant et al., Ch. 4*	*Mon Sep 7: Labor Day (no classes). Wed Sep 9: Census date (last day to drop without a W).*
Week 4	Sep 15, 17	**The 5E Instructional Model: Engage and Explore:** Structuring engaging hooks, planning hands-on exploratory investigations, cooperative roles, and managing materials in elementary classrooms. *Reading: Contant et al., Ch. 5*	—
Week 5	Sep 22, 24	**The 5E Instructional Model: Explain, Elaborate, and Evaluate:** Claim-Evidence-Reasoning (CER) frameworks, facilitating sense-making discussions, applying concepts to new contexts, and formative assessment probes. *Reading: Contant et al., Ch. 5–6*	—
Week 6	Sep 29, Oct 1	**Elementary Science Safety and Legal Liability:** NSTA safety guidelines, eyewash/first aid procedures, chemical handling, plant and animal safety, and liability prevention; Midterm Examination 1 in class. *Reading: Contant et al., Ch. 7*	**Midterm Examination 1 (in class).**
Week 7	Oct 6, 8	**Physical Science in Grades K–6:** Matter and its interactions, forces and motion, energy transformations, waves and light; designing developmentally appropriate physical science investigations. *Reading: Contant et al., Ch. 9; NRC Framework, Ch. 5*	—
Week 8	Oct 15	**Life Science in Grades K–6:** Plant and animal structures, life cycles, ecosystems and food webs, adaptation, and using classroom terrariums and gardens responsibly. *Reading: Contant et al., Ch. 10; NRC Framework, Ch. 6*	*Oct 12–Oct 13: Fall break (no classes).*
Week 9	Oct 20, 22	**Earth and Space Science in Grades K–6:** Weather patterns, rock cycle and soil, Earth's water, solar system models, seasons, and day/night cycles; addressing common astronomy misconceptions. *Reading: Contant et al., Ch. 11; NRC Framework, Ch. 7*	**5E Inquiry Science Investigation Design due Fri Oct 23 at 11:59 p.m.**
Week 10	Oct 27, 29	**Engineering Design and Technology in Elementary Science:** The engineering design cycle (ask, imagine, plan, create, improve), constraints, prototyping, and integrating STEM challenges into curriculum. *Reading: Contant et al., Ch. 12; NRC Framework, Ch. 8*	—
Week 11	Nov 3, 5	**Science Notebooks and Integrating Informational Literacy:** Using science notebooks for diagramming and data tracking; integrating informational trade books, read-alouds, and disciplinary vocabulary strategies. *Reading: Contant et al., Ch. 8*	*Fri Nov 6: Last day to withdraw (W) or elect Pass/No Pass.*
Week 12	Nov 10, 12	**Foundations of Elementary Health Education:** National Health Education Standards (NHES), Whole School, Whole Community, Whole Child (WSCC) model, and health literacy; Midterm Examination 2 in class. *Reading: Telljohann et al., Ch. 1–3*	**Midterm Examination 2 (in class).**

Week	Dates	Topics & Readings	Assignments & Deadlines
Week 13	Nov 17, 19	**Nutrition, Physical Activity, and Chronic Disease Prevention:** MyPlate guidelines for youth, beverage choices, promoting daily physical activity, dental hygiene, and establishing lifelong healthy habits in elementary school. *Reading: Telljohann et al., Ch. 6–7*	**Elementary Health Education Microteaching Simulation due Fri Nov 20 at 11:59 p.m.**
Week 14	Nov 24	**Social-Emotional Wellness and Personal Safety:** Teaching emotional literacy, conflict resolution, anti-bullying curricula, sun and fire safety, personal boundaries, and abuse prevention education. *Reading: Telljohann et al., Ch. 8–10*	*Nov 25–Nov 27: Thanksgiving break (no classes).*
Week 15	Dec 1, 3	**Integrated Unit Planning Workshop:** Synthesizing science inquiry and health concepts into a coherent multi-day unit plan; peer feedback on 5E lesson sequences and assessment rubrics. *Reading: Selected unit planning samples*	—
Week 16	Dec 8	**Course Synthesis and Science Educator Identity:** Reflecting on inquiry-based pedagogy, fostering wonder in young learners, professional teacher organizations (NSTA), and unit portfolio submission. *Reading: Course review packet*	*Wed Dec 9: Last day of classes. Thu Dec 10: Reading Day.*
Finals	Dec 17	**Integrated Elementary Science & Health Unit Plan & Portfolio** due by the end of the scheduled final exam period, Thursday, December 17, 2026, 10:30 a.m.–12:30 p.m.	No final examination.

Course Policies

Attendance Policy

Regular attendance and active engagement in hands-on science inquiry activities and health microteaching presentations are required. Science methods relies upon experiential laboratory stations and peer-facilitated investigations that cannot be made up independently. If illness or emergency causes an absence, please contact Dr. Montoya. More than two unexcused absences will result in a lowered course grade. Students who miss the first two class meetings without notifying the instructor may be dropped. Students may miss class for religious observance without penalty if they notify the instructor in writing within the first two weeks of the semester (by Wednesday, September 9, 2026). Absences for university-sponsored activities (athletics, performances, conferences) are excused with a letter from the sponsoring office at least one week in advance.

Late Work Policy

Assignments submitted after the deadline will be penalized 10% per calendar day up to three days. Submissions after 72 hours will receive no credit. Weekly Canvas quizzes must be completed by the Monday deadline.

Teacher Education Admission Prerequisite

Enrollment in EDUC 325 requires formal Admission to Teacher Education (at least 45 earned credits, 2.750 GPA, basic skills test, and background check). Candidates must achieve a minimum grade of C+ in EDUC 325 to fulfill degree and licensing requirements.

Final Exam Policy

EDUC 325 has no final examination. The integrated elementary science & health unit plan & portfolio takes its place. Nothing is due on Reading Day (Thursday, December 10, 2026).

Academic Integrity

Alkimi University is an academic community devoted to rigorous scholarship, open intellectual inquiry, and uncompromising ethical conduct. All students are subject to the regulations of the Alkimi University Academic Integrity Policy. Academic dishonesty—including plagiarism, cheating on examinations,

unauthorized collaboration, fabrication of empirical data, and unauthorized submission of academic work generated by artificial intelligence—undermines the integrity of the university and carries severe disciplinary sanctions. Sanctions range from a failing grade on an assignment or exam to an administrative course failure recorded as an 'XF' on the official transcript, academic suspension, or expulsion. Suspected violations are formally investigated and resolved through the Office of Academic Integrity in accordance with Faculty Handbook §6. For detailed information, consult the Office of Academic Integrity, Lovell Hall 315, (555) 555-0163, integrity@university.alkimi.ai.

Accessibility Services

Alkimi University is committed to providing equitable educational access and reasonable accommodations for all students with documented disabilities, including physical, sensory, psychological, learning, and chronic health conditions. Students requesting academic accommodations must formally register with the Office of Accessibility Services, Harlan Hall 204, (555) 555-0155, access@university.alkimi.ai. Once approved, students will receive an official Faculty Accommodation Letter detailing approved accommodations. Students should present this letter to the instructor as early in the semester as possible, and at least one week prior to any exam or assignment requiring accommodation. Accommodations cannot be applied retroactively.

Student Wellness and Mental Health

Your physical health, psychological well-being, and mental health are essential to your academic success. If you experience heightened stress, anxiety, depressive symptoms, personal trauma, or academic burnout, free, confidential counseling and medical care are available through the Hollis Health & Counseling Center, located in the Hollis Center. Routine appointments are available Monday–Friday 8:00 a.m.–6:00 p.m. and Saturday 10:00 a.m.–2:00 p.m. during the semester by calling (555) 555-0190 or emailing health@university.alkimi.ai. Urgent, 24/7 crisis psychological counseling is accessible immediately at (555) 555-0199.

Campus Student Support Services

- **Academic Advising Center:** Lovell Hall 101 | (555) 555-0158 | advising@university.alkimi.ai
- **Writing Center:** Whitcombe Library 3rd Floor | Free consultations on papers, reports, and research projects at any stage.
- **Whitcombe Library:** Whitcombe Library, Main Floor | (555) 555-0170 | askalibrarian@university.alkimi.ai
- **Hollis Health & Counseling Center:** Hollis Center | (555) 555-0190 | 24/7 Counseling Line: (555) 555-0199 | health@university.alkimi.ai
- **Elementary Science & Health Resource Center:** Lovell Hall 128 | Hands-on inquiry equipment kits, health curricula, and lesson design office hours with Dr. Montoya.