

Eastern Oregon University Course Syllabus

Course Number:

EDU 317

Name of Course:

Elementary Science & STEM Methods

Catalog Description:

This course introduces candidates to the Next Generation Science Standards, the goals and standards of the elementary science curriculum, and support materials. Participants will learn appropriate methods and strategies for teaching science in elementary grades including the foundations of STEM Education (science, technology, engineering, and mathematics). This includes standards-based lessons that are inquiry-based and engaging.

Credit Hours:

3

Instructor:**Required Texts or Suggested Materials:**

Link to the EOU Bookstore: [Eastern Oregon University Bookstore \(opens in new tab\)](#)

Prerequisites:

Admission to program

Learning Outcomes:

By the end of this course, candidates should be able to:

1. Identify effective teaching strategies and resources in both science and integrated STEM at the elementary level, in particular instruction focused on scientific inquiry and engineering design principles.
2. Demonstrate an awareness and knowledge of the Next Generation Science Standards (NGSS) for science instruction and how both the NGSS and other standards, like the Common Core State Standards in Mathematics (CCSSM), may be integrated into STEM contexts.
3. Understand the difference between instruction which is focused on an individual area within STEM (science, technology, engineering, or mathematics) and an integrated approach to STEM topics.
4. Recognize how tasks aligned with standards, like the NGSS and CCSSM, along with rubrics like the Oregon Science Inquiry Scoring Guide, can be used as tools for assessment in science and STEM contexts.

5. Demonstrate ability to design and implement age-appropriate science and integrated STEM lessons at the elementary level, consistent with NGSS, using appropriate resources.

Alignment of course outcomes to required standards

Course Outcomes	InTASC	Multiple Subjects Standards (TSPC)	EOU Program Outcomes
1	4,5,7, 8	3, 4, 9	1, 3,6
2	4,5,7	3, 4, 9, 11	3,6
3	4,5,7, 8	3, 4, 9, 11	3,
4	4,5,6, 7	3, 4, 16	3,4
5	6, 7, 8	3, 4, 9, 12	1, 3,4,6

Alignment of Course Assignments to Course Outcomes

Assignment	Course Outcome
Science/STEM Biography	1
Reflections/activities: effective practices	1-5
NGSS Analysis	2
Assessment Analysis	4
Resources Research	1,5
Science/Engineering Design Lesson	1-5

Course Requirements/*Assignments/Attendance Expectations

The assignments are due on the day listed. Each assignment is worth a specific percentage of your overall grade, as indicated below.

Assignments

1. Science/STEM Biography (10%)
 - a. Purpose: Reflect on past experience in STEM contexts as a student, and how those experiences may or may not have aligned with effective instructional practices.
2. Reflections/activities related to effective practices in science and integrated STEM (35%)
 - a. Purpose: Develop an understanding of best practices in science and STEM education at the elementary level by reflecting on material from the course text and other sources, along with activities/applications modeling effective practices. Particular emphasis is given to scientific inquiry, engineering design, and integrated STEM approaches to instruction.
3. Next Generation Science Standards Analysis (10%)
 - a. Purpose: Understand how to read and implement the Next Generation Science Standards through an investigation of the NGSS.
4. Assessment Analysis (10%)

- a. Purpose: Review and analyze sample student work in science in order to understand how rubrics and other tools can be used to assess student learning in science and STEM.
5. Science/STEM Resources Research (10%)
 - a. Purpose: Understand the variety of resources which are available for science and STEM instruction, and differentiate between high-quality and low-quality materials.
6. Science Inquiry or Engineering Design Lesson (25%)
 - a. Purpose: Adapt or create, then implement (i.e. small group mini-teach) a Science Inquiry or Engineering Design lesson plan which aligns with NGSS.

Student Evaluation and Grading

Grades will be assigned according to the quality of thought and ideas expressed in writing, and the completeness of the assignment. Grades are based on a straight percentage. Assignments are to be handed in on the specific due date. The grades will be determined as follows:

Letter Grade:	Percentage:
A	100 – 94
A-	93– 90
B+	89 – 88
B	87 – 84
B-	83 – 80
C+	79 – 78
C	77 – 74
C-	73 – 70
D+	69 – 68
D	67 – 64
D-	63 – 60
F	Fewer than 60 percent

Brief Outline of Course:

This course will be a face-to-face course that will combine outside readings, lecture, and in-class application activities.

General Education Category and Outcomes:

[Insert text here if GEC course]

University Writing Requirement Outcomes:

[Insert text here if UWR]

Writing Center Statement:

The EOU Writing Center provides a place — physical or virtual — where every EOU student can find an interested, responsive reader. Writing tutorials are free of

charge for EOU undergraduate and graduate students and are available for writing at any course level and for writing resumes, job letters, and graduate applications. For drop-in hours or to schedule in-person, synchronous online, or asynchronous online tutoring, please visit the EOU Writing Center: [Writing Center – Eastern Oregon University \(opens in new tab\)](#).

Classroom Decorum:

[Insert text here]

Academic Misconduct Policy:

Eastern Oregon University places a high value upon the integrity of its student scholars. Any student found responsible for an act of academic misconduct (including but not limited to cheating, unauthorized collaboration, fabrication, facilitation, plagiarism or tampering) may be subject to having his or her grade reduced in the course in question, being placed on probation or suspended from the University, or a combination of these.

Accommodations/Students with Disabilities Policy:

Any student who feels they may need accommodation for any type of disability must contact the Disability Services Office in Loso Hall, Room 233. Phone: 541-962-3081.

Disclaimer:

This standard syllabus provides only general information on the course. For those enrolled in the course a detailed syllabus will be provided by the Instructor at the beginning of the term. Please keep in mind that not all courses are offered every year.

Tentative Course Schedule

Week	Topic	Assignments
1	Principles of effective science instruction NGSS	STEM Biography NGSS Analysis
2	What is scientific inquiry? Learning Objectives in Science Evaluating Science Resources	Science Resources Review
3	Integrated STEM Approaches	STEM resources Review
4	Assessment in science/STEM contexts	Assessment Analysis
5	Evaluating Science Inquiry/ Engineering Design Lessons	Science Inquiry or Engineering Design Plan/Mini-teach

Revised by

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