Course Syllabus

Jump to Today ✎ Edit

Here is the downloadable version of the syllabus

Introduction

How do teachers assist elementary children in doing science and understanding science concepts? What classroom conditions facilitate elementary children's understanding in science? What methods can teachers employ with elementary children to excite them about learning science? These are just a few of the questions we will be addressing over the course of this semester. You will explore these ideas through thinking about yourself as a science learner; by demonstrating reflective teaching practices; and through reading, writing and discussing ideas about elementary science teaching and learning.

Course Rationale----The purposes of this course include helping you to:

- clarify and refine your understanding of three key knowledge elements for teaching inquiry-based science (science concepts, scientific thinking [nature of science], and scientific practices/skills);
- become aware of elementary children's ideas in science through various questioning, writing, and talking techniques and consider methods for developing more scientifically correct ideas;
- learn, practice and reflect upon various teaching strategies for elementary science;
- integrate concepts outlined in national and/or state standards into your lesson planning;
- explore, discuss and develop ways of assessing student learning in inquiry-based science;
- analyze and evaluate student learning and your own teaching to improve both areas;
- explore similarities and differences between science and engineering.

Course Learning Objectives----By the end of this course you should be able to:

- Demonstrate an understanding of the **three forms of knowledge** associated with learning about science and developing a scientific understanding in K-6. These include: a) *content* knowledge (e.g., factual knowledge of theories, laws, etc. of the various disciplines of science), b) *scientific practices* associated with the process skills and habits of mind of doing science, and c) the *nature of science* (NOS) which explains how science as a discipline works and how knowledge is formed in science.
- Exhibit **appropriate questioning techniques** to uncover elementary students' conceptual understanding about grade level appropriate topics.
- Illustrate an understanding of **how elementary children think** about scientific phenomenon by reflecting on what you observe or teach in the field.
- Describe the difference between formative and summative **assessment** and develop various forms of formative assessment to support your science teaching observation, as well as a scoring guide/rubric for assessing a long -erm inquiry project.
- Design a series of science lessons that incorporate a **learning cycle model** (e.g., 5E) and within these lessons select from a **variety of teaching strategies** to stimulate student interest and assess

for students understanding of the science concepts (e.g., forming explanations [CER], productive talk moves, use of various writing prompts).

- **Reflect** upon your learning of how to teach science over the course of the semester referencing course readings and what you have observed first-hand in your field teaching. Identify **areas of strength and those you will seek to improve** with future professional development.
- **Design** a STEAM problem scenario illustrating the major components of STEAM education and articulating the rationale behind this instructional approach**.**

Course Topics

Through your experiences in the field, course readings, class discussions and assignments the following topics will be examined to support your understanding of effective methods for teaching science. In particular, the focus will be on developing a foundation of appropriate pedagogical content knowledge (PCK) needed to teach elementary science that you will continue to build on as you move to the classroom. Instructional methods associated with developing your PCK will include:

- Using a learning cycle instructional approach to promote engagement, exploration, explanation/discussion, and application of science ideas with students.
- Formulating a variety of questions to serve different purposes (e.g., driving inquiry-based investigations, stimulating student thinking, probing at student reasoning, etc.)
- Understanding and implementing lessons that require students to gather, analyze and reason through data.
- Studying and experiencing various approaches for incorporating writing and talk to support students' communication in science.
- Examining various ways of assessing elementary students' science learning – both formative and summative methods to a) inform practice, b) differentiate instruction, and c) promote a sense of purpose for learning about science (i.e., motivate and challenge students).
- Considering applications of science to related disciplines, such as engineering and computer science.

Course Policies

Attendance/Participation

You are expected to attend every class. Your active participation is necessary both for your own learning and that of others. Therefore, students are expected to "attend" all classes, arrive on time, and be prepared to participate in respectful ways. If it is necessary for you to be absent, please inform the instructor in advance regarding the reason for the absence. Together we will make a plan regarding the missed material.

Late Submission of Assignments

Assignments will NOT BE ACCEPTED past the due date unless an agreement is worked out with your instructor for an extension PRIOR TO the original due date. All major assignment due dates are posted

on your Canvas calendar **AT THE BEGINNING of the semester** so please be aware of these due dates and plan accordingly.

- If for any reason a section instructor determines an assignment due date needs adjustment for their section this will be discussed in class and the section instructor will have the final say.

If you contact the instructor for an extension prior to the due date of the assignment please know that extensions are not automatic. Reasonable justification is needed for an extension to be granted and it is left up to the discretion of the instructor to determine reasonableness. Extensions must be made at least 24 hours prior to the due date for an assignment. Any extension will include a new, agreed-upon submission date. No assignments will be accepted after the extension deadline has passed. Note that late assignments will have lowest priority for grading and feedback.

Writing Standard

The quality of your ideas as well as your presentation will be taken in to consideration when assigning grades. You are expected to produce written documents that are easily read, well organized, clearly understood, grammatically correct, and include no spelling errors. Your grade will be reduced if you fail to attend to these aspects of our written assignments.

Disability Services

If you have a disability for which you are or may be requesting an accommodation, you are encouraged to contact both your instructor and the Office of Disability Resources and Services, 140 William Pitt Union, at 412-648-7890 or 412-383-7355 (TTY) as early as possible, but no later than the fourth week of the term or visit the Office of Disability Resources website as early as possible, but no later than the 4th week of the term. DRS will verify your disability and determine reasonable accommodations for this course.

Academic Integrity

Students in this course will be expected to comply with the University of Pittsburgh's Policy on Academic Integrity (**www.cfo.pitt.edu/policies/policy/02/02-03-02.html (http://www.cfo.pitt.edu/policies/policy/02/02-03-02.html)**). Any student suspected of violating this obligation for any reason during the semester will be required to participate in the procedural process, initiated at the instructor level, as outline in the University Guidelines on Academic Integrity. This may include, but is not limited to, the confiscation of the examination of any individual suspected of violating University Policy. Furthermore, no student may bring any unauthorized materials to an exam, including dictionaries and programmable calculators.

Sexual Harassment

The University of Pittsburgh is committed to the maintenance of a community free from all forms of sexual harassment. Sexual harassment violates University policy as well as state, federal, and local laws. It is neither permitted nor condoned. It is also a violation of the University of Pittsburgh's policy

against sexual harassment for any employee or student at the University of Pittsburgh to attempt in any way to retaliate against a person who makes a claim of sexual harassment. Any individual who, after thorough investigation and an informal or formal hearing, is found to have violated the University's policy against sexual harassment, will be subject to disciplinary action, including, but not limited to, reprimand, suspension, termination, or expulsion. Any disciplinary action taken will depend upon the severity of the offense. For more information, see the Web site: **https://www.pitt.edu~provost/har.html (https://www.pitt.edu~provost/har.html)**

Diversity and Inclusion Statement

I consider this classroom to be a place where you will be treated with respect, and I welcome individuals of all ages, backgrounds, beliefs, ethnicities, genders, gender identities, gender expressions, national origins, religious affiliations, sexual orientations, ability – and other visible and nonvisible differences. All members of this class are expected to contribute to a respectful, welcoming and inclusive environment for every other member of the class.

Names and Pronouns

I will gladly honor your request to address you by your name and pronoun (that may differ from the school records). Please advise me of this preference early in the term so that I may make appropriate changes to my records. You may email me at **cquigley@pitt.edu (mailto:cquigley@pitt.edu)** or tell me in person in class, whichever is most comfortable to you! I want to be sure you feel yourself and comfortable in our class community.

Copyright Statement

These materials may be protected by copyright. United States copyright law, 17 USC section 101, et seq., in addition to University policy and procedures, prohibit unauthorized duplication or retransmission of course materials. See Library of Congress Copyright Office and the University Copyright Policy.

Statement on Classroom Recording

To ensure the free and open discussion of ideas, students may not record classroom lectures, discussion and/or activities without the advance written permission of the instructor, and any such recording properly approved in advance can be used solely for the student's own private use.

G-grades

If unforeseen events (such as major illness) prevent a student from timely completion of course work he/she may request a meeting with the instructor to discuss the possibility of earning a "G" grade for the term. If both student and instructor agree to the "G" grade, they collaboratively write a document that describes, in detail, what the student needs to do to complete the required course work and the time frame (not to exceed one academic year) within which he/she must do so. Upon receiving all work, the course instructor would evaluate the work and send forward to the Associate Dean a request for the permanent grade.

Assignments/Grades

1. *Professionalism:* **worth 20% of your final course grade**

Due to the interactive nature of this course, regular attendance and high quality participation are expected. **Being a professional in this class means:** a) being prepared for class discussion by completing all required readings, b) thinking critically and metacognitively about your responses to the readings when asked (in either oral or written format), c) actively participating in and reflecting on all class activities and group discussions), and d) respecting your classmates, yourself, and the instructor by helping to build a positive science learning community.

No Texting or Emailing or using other online social media during class unless it is explicitly a part of the course

Your professionalism score consists of the following components:

1. Reading Check Quizzes – there will be two in-class quizzes throughout the semester on course readings and the points for the quizzes will added with your attendance/participation points to be converted to 20% of your course grade.

The quizzes will occur:

- Week 7--- Oct. 8
- Week 13 --- Nov. 19
- PLEASE be sure to bring your laptop to class both of these days to complete the quizzes online in Canvas. If you do not have access to a laptop you can use one of the desktop computers in the classroom but those are limited.
- If you need testing accommodations made, please be sure to speak with your E328 instructor before the day of the quiz so arrangements can be made for each of these quiz days.

1. Attendance/Participation – You will receive **2 points per class** –

- 2pts = on time, all readings/assignments ready to go, and active participation in class discussion or activities.
- 1pt = late, it is obvious readings, **or** assignments were not completed for class, **or** limited participation in class discussion/activities.
- 0pts = did not attend class

Active participation in class means: willing share/volunteer ideas during class discussions, thinking critically during writing tasks, and engage in elementary science activities to understand what K-6 students might experience.

Any evidence of texting, emailing or using any other online social media during class automatically results in a 1 pt deduction for the class.

REMINDER: Your instructor will share with your attendance/participation score about mid-semester so you know where you stand going into the second half of the semester.

2. A Learning Cycle Experience – Teaching in the Field: **worth 25% of your final course grade**

The purpose of this assignment is to help you learn how to interpret standards documents and curriculum materials as you prepare a series of science lessons that you will teach in your teaching teams (defined in class). With this assignment you will learn to: 1) develop a set of coherent lessons that progress logically from one concept to the next, 2) gain practice using the 5E model of instruction to design and teach a series of connected and inter-related science lessons on a science topic, which will be provided to you, and 3) develop and implement formative assessment strategies (including questioning) to make necessary adjustments to your lessons. Please note that at least half of the Learning Cycle Assignment is a GROUP assignment so everyone is responsible for ensuring the lessons are effectively designed and implemented. You will have the opportunity to evaluate your teaching team members' contributions to this assignment.

See Major Course Assignments File – "Learning Cycle" for a complete description of what you need to do for each phase of this assignment and how you will be evaluated.

3. Long-term Inquiry Development and Tech Integration Presentation: **worth 10% of your final course grade**

For this assignment you will work in small groups (different from your teaching team) to plan and develop and assessment for a long-term inquiry project you would conduct with elementary students. The purpose of this assignment is for you to demonstrate how you support students with developing an inquiry-based question that will afford them the opportunity to gather data over a period of several classes, analyze the data, and formulate an evidence-based explanation that answers the question. The project will also integrate technology and provide an opportunity to demonstrate how technology can enhance student learning. You will need to consider also what product you want your students to develop to demonstrate what they have learned and a rubric for how you would assess their learning. These plans will be presented in class at the end of the semester in a digital gallery walk.

See Major Course Assignments File – "Long-Term Inquiry Presentation" for a complete description of what you need to do for this assignment and how you will be evaluated.

4. *STEAM Problem Scenario and Unit Draft:* **worth 25% of your final course grade**

In this assignment, you will demonstrate your ability to integrate science with other disciplines which helps to engage all learners in science. To do this, you will develop a STEAM Problem Scenario and describe the components of STEAM as well as a rationale for this problem scenario.

See Major Course Assignments File – "STEAM Problem Scenario and Unit Draft" for a complete description of what you need to do for this assignment and how you will be evaluated.

All course assignments will be graded using criterion-referenced methods. That is, they will be scored against a specific set of standards as will be outlined in each assignment's scoring guide or rubric.

Each assignment is calculated using a point system then converted to a percentage that corresponds to the percent weight of the assignment (see assignment descriptions above for the percentage weight of each assignment). Your percent scores for all assignments are then totaled to give your overall course percentage. The following scale will be used to determine your final letter grade.

Take notice that your assignment and total course percentage to one decimal point in order to provide a more balanced reflection of your learning across all individual and group projects.

94.0% - 100.0% = A 90.0% - 93.9% = A-

87.0% - 89.9% = B+ 84.0% - 86.9% = B 80.0% - 83.9% = B-

77.0 % - 79.9% = C+ 74.0% - 76.9% = C

-

Course Summary:

Date	Details	
Tue Aug 27, 2019	Story of Us (https://canvas.pitt.edu/courses/247/assignments/5498)	due by 7:10pm
Tue Sep 3, 2019	Audio recording of definition of observation and inference (https://canvas.pitt.edu/courses/247/assignments/5733)	due by 11:59pm
Tue Sep 10, 2019	Push and Pull- CER (https://canvas.pitt.edu/courses/247/assignments/5990)	due by 11:59pm
	Readings for September 10 (https://canvas.pitt.edu/courses/247/assignments/5759)	due by 11:59pm
Tue Sep 24, 2019	VR and Tour Creator (https://canvas.pitt.edu/courses/247/assignments/7171)	due by 7:10pm
	Learning Cycle Project- Phase One (https://canvas.pitt.edu/courses/247/assignments/3940)	due by 11:59pm
	Readings for September 24 (https://canvas.pitt.edu/courses/247/assignments/7108)	due by 11:59pm
Tue Oct 1, 2019	Birdbrain Technology Activity (https://canvas.pitt.edu/courses/247/assignments/7296)	due by 7pm
	Learning Cycle Project Phase Two Part One- For Peer Review (https://canvas.pitt.edu/courses/247/assignments/3941)	due by 11:59pm
Tue Oct 8, 2019	Learning Cycle Phase 2 Peer Review (https://canvas.pitt.edu/courses/247/assignments/7392)	due by 7pm
Tue Oct 15, 2019	Reading Quiz 1 (https://canvas.pitt.edu/courses/247/assignments/3948)	due by 6pm
	Formative Assessment with a tech tool (https://canvas.pitt.edu/courses/247/assignments/7389)	due by 11:59pm
Tue Oct 22, 2019	Learning Cycle Project Phase Three: Revising Lesson Plans (version 2) for Instructor Feedback (https://canvas.pitt.edu/courses/247/assignments/3943)	due by 11:59pm

Date	Details	
Tue Nov 5, 2019	Learning Cycle Project Phase Four: Revising Lesson Plans (version 3) for FINAL Grade (https://canvas.pitt.edu/courses/247/assignments/3944)	due by 11:59pm
	Plan for STEAM Unit (https://canvas.pitt.edu/courses/247/assignments/21929)	due by 11:59pm
Tue Nov 12, 2019	Online Class Discussion (https://canvas.pitt.edu/courses/247/assignments/22417)	due by 6:30pm
	Online Assignment for Class Nov. 12 (https://canvas.pitt.edu/courses/247/assignments/22416)	due by 11:59pm
Tue Nov 19, 2019	Learning Cycle Project Phase Five: Self and Peer Evaluations (https://canvas.pitt.edu/courses/247/assignments/3945)	due by 4:30pm
	Long Term Inquiry and Tech Integration Project (https://canvas.pitt.edu/courses/247/assignments/3950)	due by 4:30pm
Tue Nov 26, 2019	Learning Cycle Project Self and Peer Evaluation Grade (https://canvas.pitt.edu/courses/247/assignments/3946)	due by 11:59pm
Tue Dec 3, 2019	Making Day (https://canvas.pitt.edu/courses/247/assignments/39932)	due by 8pm
	Reading for Dec. 2 (https://canvas.pitt.edu/courses/247/assignments/40091)	due by 11:59pm
Tue Dec 10, 2019	STEAM Problem Scenario and Rationale (https://canvas.pitt.edu/courses/247/assignments/3951)	due by 4:30pm
	STEAM Presentation (https://canvas.pitt.edu/courses/247/assignments/3952)	due by 7:30pm
	Reading Quiz 2 (https://canvas.pitt.edu/courses/247/assignments/3949)	due by 11:59pm
	Attendance/Participation (https://canvas.pitt.edu/courses/247/assignments/3947)	
	Reading Quiz 2 (https://canvas.pitt.edu/courses/247/assignments/40322)	
	Roll Call Attendance (https://canvas.pitt.edu/courses/247/assignments/5513)	