

SCI-900 – Physical Science Activities for the Primary Grades

Independent Study Correspondence Course Syllabus

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Number of Graduate Semester Units: 3 units

Target Audience: 1st – 3rd grade teachers

Course Description

The experiments in Physical Science Activities for the Primary Grades engage students in the exploration of concepts covering water, air, energy, gravity, electricity, and magnetism. The lessons presented encourage students to take a constructivist approach to learning as they develop inquiry skills. Throughout this course, teachers will create an environment in which they work together with their students as active learners. In addition, students will increase their understanding of physical science through the presentation of investigations that allow them to manipulate common objects and materials found in their environment. The course content will allow students to not only be involved in learning experiences that answer simple questions but also communicate the results of those experiences to others. Teachers will be provided with background information for each experiment so that they may encourage alternative explanations and develop critical and logical thinking in their students.

Students in the preschool and lower primary grades can be involved at the awareness level with demonstrations that are designed to arouse their natural curiosity at the pre-conceptual level. The emphasis at this level is on the development of sensory-motor, observation, and communication skills. After students have developed readiness for a particular concept through awareness level activities, the concept can be presented by introducing it in a formal classroom lesson. The emphasis at this level is to involve students in using comparison and organizational skills. As students gain an understanding about basic science concepts, they become ready for experiences that help them to develop mastery. At this level, they can be involved in experiments that include the application of appropriate mathematical concepts and skills in interpreting data and solving problems. Although most of the students using these course activities will be involved at the awareness and formal introduction levels, each of the teacher's pages provides suggestions for challenging the higher achieving students through use of extension investigations.

Note: Required textbook and course material are included in the course fees and will be sent via postal mail after registering.

Required Texts and Course Materials

Course Materials: In addition to the course manual, *Physical Science Activities for the Primary Grades*, contained within the Welcome email, the instructor will send the following materials via US mail: Science Materials: Straw, Dowel, 3 Balloons, Suction Cup, Candle, Walnut, Cow Magnet, Eyedropper, Flat Magnet, Battery Holder, Hand Lens, Clown, Bulb and Socket, 3 Wires

Course Packet: The course packet includes information about the course, instructions and rubrics for completing course assignments, information about Fresno Pacific University (FPU), and specifics on FPU and Continuing Education policies and procedures.

Course Dates

Self-paced; students may enroll at any time and take up to one year, from the date of registration, to complete assignments. Students may complete assignments in no less than three weeks for a 3-unit course (one week per unit).

National Standards Addressed in This Course

National Board for Professional Teaching Standards (NBPTS)

(<http://www.nbpts.org/standards-five-core-propositions/>)

First published in 1989 and updated in 2016, [*What Teachers Should Know and Be Able to Do*](#) articulates the National Board's Five Core Propositions for teaching. The Five Core Propositions - comparable to medicine's Hippocratic Oath — set forth the profession's vision for accomplished teaching. Together, the propositions form the basis of all National Board Standards and the foundation for National Board Certification. Course assignments have been designed so students can demonstrate excellence against these professional teaching standards whenever possible.

- Proposition 1: Teachers are committed to students and their learning
- Proposition 2: Teachers know the subject they teach and how to teach those subjects to students
- Proposition 3: Teachers are responsible for managing and monitoring student learning
- Proposition 4: Teachers think systematically about their practice and learn from experience
- Proposition 5: Teachers are members of learning communities

Common Core State Standards Initiative (<http://www.corestandards.org/the-standards>)

- Aligned with college and work expectations.
- Clear, understandable and consistent.
- Include rigorous content and application of knowledge through high-order skills.
- Build upon the strengths and lessons of current state standards.
- Informed by other top performing countries so that all students are prepared to succeed in our global economy and society.
- Evidence and researched based.

As you create lessons for your students you will be exploring National, State, District, or the Common Core Standards and identify how the lessons and activities you implement and develop align with those standards.

Continuing Education Program Student Learning Outcomes

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| CE 1 | Demonstrate proficient written communication by articulating a clear focus, synthesizing arguments, and utilizing standard formats in order to inform and persuade others, and present information applicable to targeted use. |
| CE 2 | Demonstrate comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts. |
| CE 3 | Reflect on their personal and professional growth and provide evidence of how such reflection is utilized to manage personal and professional improvement. |
| CE 4 | Apply critical thinking competencies by generating probing questions, recognizing underlying assumptions, interpreting and evaluating relevant information, and applying their understandings to the professional setting. |
| CE 5 | Reflect on values that inspire high standards of professional and ethical behavior as they pursue excellence in applying new learning to their chosen field. |
| CE 6 | Identify information needed in order to fully understand a topic or task, organize that information, identify the best sources of information for a given enquiry, locate and critically evaluate sources, and accurately and effectively share that information. |

Student Learning Outcomes (SLOs) for This Course

| Student Learning Outcomes for This Course By the end of this course student will be able to: | National Standards Addressed in This Course* | Continuing Education Program Student Learning Outcomes Addressed** |
|---|---|---|
| 1. Create an environment in which teachers and students work as active learners and students are encouraged to communicate knowledge. | | |
| 2. Implement experiments based on the natural curiosity of primary grade students that allow them to explore by observation and manipulation of common objects and materials found in their environment. | | |
| 3. Engage students in experiments that will provide the foundation for basic science concepts and require the application of the science processes: observing, communicating, comparing, organizing, relating, inferring, and applying. | | |
| 4. Conduct investigations designed to teach primary grade students how to interpret data while developing problem-solving skills. | | |
| 5. Align science standards and objectives with course content | | |
| 6. Integrate science lessons into other areas of the curriculum. | | |
| 7. Encourage parent participation by using activities for homework assignments. | | |

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| 8. Promote staff interaction through observation and sharing. | | |
| 9. Review and analyze current trends in science education | | |

* Please refer to the section on **National Standards Addressed in This Course**

** Please refer to the section on **Continuing Education Program Student Learning Outcomes**

Topics, Assignments, and Activities

| Module Module Title | Module Assignments and Activities | Points Possible for Each Assignment |
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| Module 1 – Standards-Based Instruction | <ul style="list-style-type: none"> Locate and explore relevant science standards Reflect upon how standards guide teaching practices | 20 pts |
| Module 2 – Learning Activities | <ul style="list-style-type: none"> Identify 15 activities in the course content appropriate for the level of the students in your classroom Align each of the activities to national, state, or district standards Implement the activities and complete a reflection for each one assessing the results Assign at least one activity as a homework assignment | 40 pts |
| Module 3 – Teacher Collaboration | <ul style="list-style-type: none"> Promote staff interaction and collaboration through the sharing of ideas and relevant teaching practices OR Explore and evaluate 2 science WebQuests | 10 pts |
| Module 4 – Article Review | <ul style="list-style-type: none"> Review and analyze current trends in the teaching of science specifically related to your teaching situation | 10 pts |
| Module 5 – Reflective Essay | <ul style="list-style-type: none"> Reflect upon the course content and analyze the implications for teaching | 10 pts |
| Module 6 – Create an Activity | <ul style="list-style-type: none"> Develop an extension activity that links another subject for two of the experiments | 10 pts |
| TOTAL POINTS | | 100 points |

Grading Policies, Rubrics, and Requirements for Assignments

Grading Policies

- Assignments will be graded per criteria presented in the course rubrics.
- A = 90-100% and B = 80-89%, (anything below 80% will not receive credit.)
- The discernment between an A or a B letter grade is at the discretion of the instructor based on the quality of work submitted (see course rubrics).
- Coursework falling below a B grade will be returned with further instructions.
- All assignments must be completed to receive a grade and are expected to reflect the quality that teacher-training institutions require of professional educators. If completed assignments do not meet this standard, students will be notified with further instructions from the instructor.

Grading Rubrics

| Grade | Percentage | Description | Rubric |
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| A | 90-100% | Excellent | Meets all course / assignment requirements with significant evidence of subject mastery and demonstration of excellent graduate level professional development scholarship. |
| B | 80-89% | Very Good | Adequately meets criteria for all course/assignment requirements - demonstrates subject competency with very good graduate level professional development scholarship. |
| NC | Below 80% | Unacceptable | Does not meet the minimum criteria for all course/assignment requirements and demonstrated little, if any, evidence of acceptable graduate level professional development scholarship. |

Writing Requirements

- **Superior:** Writing is clear, succinct, and reflects graduate level expectations. Clearly addresses all parts of the writing task. Maintains a consistent point of view and organizational structure. Include relevant facts, details, and explanations.
- **Standard:** Writing is acceptable with very few mistakes in grammar and spelling. Addresses most parts of the writing task. Maintains a mostly consistent point of view and organizational structure. Include mostly relevant facts, details, and explanations.
- **Sub-standard:** Writing contains noticeable mistakes in grammar and spelling. Does not address all parts of the writing task. Lacks a consistent point of view and organization structure. May include marginally relevant facts, details, and explanations.

Lesson Plan Requirements

- **Superior:** Instructional goals and objectives clearly stated. Instructional strategies appropriate for learning outcome(s). Method for assessing student learning and evaluating instruction is clearly delineated and authentic. All materials necessary for student and teacher to complete lesson clearly listed.
- **Standard:** Instructional goals and objectives are stated but are not easy to understand. Some instructional strategies are appropriate for learning outcome(s). Method for assessing student learning and evaluating instruction is present. Most materials necessary for student and teacher to complete lesson are listed.
- **Sub-standard:** Instructional goals and objectives are not stated. Learners cannot tell what is expected of them. Instructional strategies are missing or strategies used are inappropriate. Method for assessing student learning and evaluating instruction is missing. Materials necessary for student and teacher to complete lesson are missing.

Instructor/Student Contact Information

This course requires a minimum of three contacts between the student and the instructor. The first contact point occurs after the student enrolls in the course. The instructor contacts the student by phone to welcome them to the course and Fresno Pacific University. The instructor provides an overview of the course, material, assignments, and expectations for successful completion of the course. This initial interaction also establishes a foundation for future interactions (via email or phone). The second interaction should occur when the student is approximately half-way through the course. The instructor can field any assignment questions and learn what has been most beneficial to the student so far. The final conversation occurs at the end of the course. This

interaction provides a final check that all assignments have been completed, final grade request has been submitted, and answer any final questions or concerns.

Coursework Hours

Based on the Carnegie Unit standard, a unit of graduate credit measures academic credit based on the number of hours the student is engaged in learning. This includes all time spent on the course: reading the textbook, watching videos, listening to audio lessons, researching topics, writing papers, creating projects, developing lesson plans, posting to discussion boards, etc. Coursework offered for FPU Continuing Education graduate credit adheres to 45 hours per semester unit for the 900-level courses. Therefore, a student will spend approximately 135 hours on a typical 3-unit course.

Services for Students with Disabilities

Students with disabilities are eligible for reasonable accommodations in their academic work in all classes. In order to receive assistance, the student with a disability must provide the Academic Support Center with documentation, which describes the specific disability. The documentation must be from a qualified professional in the area of the disability (i.e. psychologist, physician or educational diagnostician). Students with disabilities should contact the Academic Support Center to discuss academic and other needs as soon as they are diagnosed with a disability. Once documentation is on file, arrangements for reasonable accommodations can be made. For more information and for downloadable forms, please go to <https://www.fresno.edu/students/academic-support/services-students-disabilities>.

Plagiarism and Academic Honesty

All people participating in the educational process at Fresno Pacific University are expected to pursue honesty and integrity in all aspects of their academic work. Academic dishonesty, including plagiarism, will be handled per the procedures set forth in the Fresno Pacific University Catalogue - <https://www.fresno.edu/students/registrar-office/academic-catalogs>

Technology Requirements

To successfully complete the course requirements, course participants will need Internet access, can send and receive email, know how to manage simple files in a word processing program, and have a basic understanding of the Internet. Please remember that the instructor is not able to offer technical support. If you need technical support, please contact your Internet Service Provider.

Final Course Grade and Transcripts

When all work for the course has been completed, students will need to logon to the Continuing Education website (<https://ce.fresno.edu/my-account>) and "Request Final Grade". Once the instructor receives the requests and submits the grade online, students may log back in to view their Final Grade Report or order transcripts online. Please allow at least two weeks for the final grade to be posted. For more information, see the Continuing Education Policies and Procedures at <https://ce.fresno.edu/ce-policies-and-procedures>.

University Policies and Procedures

Students are responsible for becoming familiar with the information presented in the Academic Catalog and for knowing and observing all policies and procedures related to their participation in the university community. A summary of university policies may be found on the university website at <https://www.fresno.edu/students/registrars-office/academic-catalogs>.

Fresno Pacific University Student Learning Outcomes

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| Student Learning Outcomes Oral Communication: Students will <i>exhibit</i> clear, engaging, and confident oral communication – in both individual and group settings – and will critically <i>evaluate</i> content and delivery components. |
| Written Communication: Students will <i>demonstrate</i> proficient written communication by <i>articulating</i> a clear focus, <i>synthesizing</i> arguments, and utilizing standard formats in order to <i>inform</i> and <i>persuade</i> others. |
| Content Knowledge: Students will <i>demonstrate</i> comprehension of content-specific knowledge and the ability to apply it in theoretical, personal, professional, or societal contexts. |
| Reflection: Students will <i>reflect</i> on their personal and professional growth and <i>provide evidence</i> of how such reflection is utilized to manage personal and vocational improvement. |
| Critical Thinking: Students will <i>apply</i> critical thinking competencies by <i>generating</i> probing questions, <i>recognizing</i> underlying assumptions, <i>interpreting</i> and <i>evaluating</i> relevant information, and <i>applying</i> their understandings to new situations. |
| Moral Reasoning: Students will <i>identify</i> and <i>apply</i> moral reasoning and ethical decision-making skills, and <i>articulate</i> the norms and principles underlying a Christian world-view. |
| Service: Students will <i>demonstrate</i> service and reconciliation as a way of leadership. |
| Cultural and Global Perspective: Students will <i>identify</i> personal, cultural, and global perspectives and will employ these perspectives to <i>evaluate</i> complex systems. |
| Quantitative Reasoning: Students will accurately <i>compute</i> calculations and symbolic operations and <i>explain</i> their use in a field of study. |
| Information Literacy: Students will <i>identify</i> information needed in order to fully understand a topic or task, <i>explain</i> how that information is organized, <i>identify</i> the best sources of information for a given enquiry, <i>locate</i> and critically <i>evaluate</i> sources, and accurately and effectively <i>share</i> that information. |