

HOLY FAMILY UNIVERSITY
EDUCATION 511: Teaching Science and Health in the Elementary Schools
Spring, 2011

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School of Education Commitment Statement

The School of Education is dedicated to the mission of Holy Family University, which affirms the dignity of the person and the oneness of the human family.

We in the School of Education embrace the acceptance of and respect for all children and their families. We strive to empower our students with the knowledge, skills and attitudes needed to teach in the 21st Century. By embracing constructivist pedagogy, we advocate teaching and learning as active and interactive processes that further the development of all children.

We in the School of Education foster life-long learning and view literacy, technology, and diversity as the foundation of critical and creative thinking. We are committed to teaching our preservice teachers to become effective and confident communicators.

We in the School of Education teach our students to articulate, integrate and reflect upon effective strategies to classroom instruction

Required texts:

Carin, A.A., Bass, J.E., Contant, T.L. (2009) *Teaching Science as Inquiry (11th Edition)*. Upper Saddle River New Jersey: Pearson/Merril Prentice Hall Publishing Co.

Course CD—available from the instructor

Suggested Readings:

American Association for the Advancement of Science. Benchmarks for Science Literacy: Project 2061. New York: Oxford University Press. 1993.

American Association for the Advancement of Science. Science for All Americans. New York: Oxford University Press. 1990.

Center for Science, Mathematics and Engineering Education. Science for All Children, A Guide to Improving Elementary Science Education in Your School District. 1997.

Pennsylvania Department of Education, *Academic Standards for Science and Technology* [22 Pa. Code, Ch. 4, Appendix B]. 2001

Pennsylvania Department of Education, *Assessment Anchors Science Grade 4 and Grade 8*. 2007.

Sutman, F.X., Schmuckler, J.S., Woodfield, J. The Science Quest: Using Inquiry/Discovery to Enhance Student Learning. San Francisco, CA: Josey Bass. 2008

Wiggins, G. McTighe, J. Understanding By Design, ASCD: 1998

Course Description.

The focus of the course will be on your role as an elementary teacher in promoting science literacy for all students. As you will come to understand in this course, students often fail to learn science concepts with meaningful understanding because they have previous conceptions that conflict with new understanding. However, there are ways of teaching science that can help students learn science in meaningful ways. In teaching science you should try to help your students understand the world around them in a meaningful way rather than merely memorize scientific facts and definitions. Process *focus will be* on integrated process skills of formulating hypotheses, interpreting data, making operational definitions, experimenting, investigating and problem solving.

Pennsylvania Standards

Chapter 354 Regulations Specific to Elementary Science Education

I. Knowing the Content

The professional education program provides evidence that Elementary Education certification candidates complete a program of Elementary Education studies the same as the academic content area courses and required electives of a major in a bachelor's degree. The program shall require the candidates to demonstrate their knowledge of the fundamental concepts of Elementary Education and competence in applying developmentally appropriate practices to meet the diverse needs of all elementary students (K-6) including:

I.A. Growth, development and learning including: cognitive development and theories of learning, oral and written language development, typical and atypical physical growth and motor development, social and personal development

I.B. Methods and issues of assessment and evaluation including: diagnostic, formative and summative instruments, formal, informal and authentic assessment procedures, biases, tracking, labeling and lowered expectations, aligning assessment to teaching and learning of special needs students

I.E. Science instruction at the elementary level in accordance with the Pennsylvania Academic Standards including: integrated concepts and processes of earth/space, life and physical sciences, current instructional technologies, hands-on science activities and direct and inquiry teaching strategies, scientific, societal, environmental and ethical problems and issues

II. Performance

The professional education program provides evidence of the candidates participation in sequential and developmental field experiences and student teaching, under the supervision of college personnel and cooperating teachers who are well trained, have interpersonal skills and demonstrated competence in teaching. The program also provides evidence that the criteria and competencies for exit from the Elementary Education certification program are assessed in coursework, field experiences and student teaching and require the candidates to demonstrate their knowledge and competence in foster student learning through:

II.A. Managing the instructional environment creating a positive, inclusive learning environment, establishing and maintaining rapport with all students, communicating high learning expectations to all students, establishing and maintaining fair and consistent standards of classroom behavior, creating a safe physical environment that is conducive to learning

II.B. Planning of instruction based upon knowledge of the subject matter, learning theory, classroom environment, students, the community and the Pennsylvania Academic Standards including: alignment of curriculum, instruction, and assessment, multidisciplinary curriculum integration, collaborating with appropriate subject area specialist

II.C. Computer-mediated communications and emerging technologies including: audiovisual hardware and other presentation tools, productivity tools, internet searches and electronic mail

II.D. Selecting, implementing and adapting effective instructional strategies, curriculum resources and technologies in collaboration with other educators to meet the needs of diverse learners including: assessing, identifying and building on the students' prior knowledge, experiences and skills in each content area, problem analysis, creativity, problem-solving, and decision-making skills, inquiry, direct instruction and cooperative learning

II.E. Developing, utilizing, and communicating appropriate measurement and evaluation procedures in the instructional program

II.F. Monitoring students' understanding of content, providing feedback to students and adjusting instructional strategies as needed

III. Professionalism

The professional education program provides evidence that Elementary Education certification candidates demonstrate knowledge of and competence in fostering professionalism in school and community settings including:

III.A. Professional organizations and professional journals

III.B. Integrity and ethical behavior, professional conduct as stated in Pennsylvania's Code of Professional Practice and Conduct for Educators; and local, state, and federal laws and regulations

Attendance:

Holy Family University does not recognize the cut system. Students are expected to attend all classes and laboratory sessions regularly and may not absent themselves except for illness or other serious matters. Students who have registered but do not attend classes (including students who have decided before the semester commences not to begin classes at all) must notify the Registrar's Office in writing that they are dropping or withdrawing from the course within the semester calendar, to avoid a failing grade for the course.

Academic Honesty

It is assumed that all work submitted is one own. Any materials that are not a student's must be referenced.

Penalties for plagiarism will be subject to university policy as outlined below:

Holy Family University expects its students to maintain the highest standards of integrity in the performance of academic assignments. Dishonesty, whether it be in quizzes, laboratory work, term papers, examinations, etc., is regarded as a serious offense and may result in failure in the course and dismissal from the University. Anyone who willfully assists another in the breach of integrity is held equally responsible and subject to the same penalty.

Guidelines for Written Assignments:

Assignments not adhering to the following guidelines not be graded. All written assignments are to include the following.

A cover sheet with the following information:

Name and date

Assignment #

Title or topic

The assignment format should:

- Be presented either typewritten or word-processed
- Be on one side of the paper only
- Be grammatically correct
- Contain no spelling errors

- Be presented professionally, e.g., stapled together, no paper clips, not ripped from a notebook; plastic report covers are not necessary.
- Font size 12 using a standard body font
- Be double-spaced.
- Referenced where required using APA style

Assignment Due Dates:

Assignments are due on the date specified on the class calendar

Assignment Format:

Each assignment will have a specific format to follow. The assignment will not be accepted if the format is not followed. Formats and assignment descriptions are provided on the Course CD along with the grading rubric for the assignment.

Classroom Presentations

Each class member will be involved in a number of science related presentations before the class. You are responsible for the preparation of all materials needed for your presentations. On the day of your presentation you are to have your materials prepared and set up to present your work and to lead the class discussion.

After each presentation there will be a discussion of the presentation by class members in which pedagogical suggestions will be made. On the day of your presentation, I will want a copy of your assignment and when possible, there should be enough copies for class members.

HFC Grading System:

A	94 to 100
B	90 to 93
B	86 to 89
C	81 to 85
C	77 to 80
D	73 to 76
D	70 to 72
F	69 and below

Course Requirements (Tentative Schedule):

Syllabus is subject to revision throughout the term. The class calendar will be distributed as well as posted on the website.

You will be graded on assignments/attendance/lateness and your demonstration that you are prepared for class. You are working toward entering a profession so now is a good time to start in terms of crafting your professional demeanor. Please do not use cell phones during class.

Assignment #1 Laboratory Safety Poster

Construct an age appropriate laboratory/experiment safety poster for the classroom. Needs to be a poster size (viewable from a distance of at least 10 feet). Be creative.

Assignment #2 Lesson Objectives

Write at least 3 lesson objectives using the described Holy Family format [Student Behaviors; Sources of Evidence; learn; Criteria for Evaluation]. The lesson topic will be assigned.

Assignment #3 Inquiry Lesson Outline and Presentation

You will be assigned (randomly) an inquiry oriented lesson from Section II of the text pages A17 – A136. You are asked to TEACH this lesson to your classmates where they will act as your 'students'. This will give you a chance to practice your teaching skills without worrying about developing the lesson.

Assignment #4 Inquiry Lesson Development, Presentation and Lesson Plan

Choose a topic in the area of elementary science and develop a full inquiry lesson plan to be presented in class. If possible, tie your lesson plan and presentation into your practicum work. Once again you will be teaching the class. You are encouraged to choose topics that cross curricula (i.e., science/math; science/soc. studies; science/language etc. You will be evaluated both on your oral presentation (40%) and your written plan (60%). You must supply your own equipment for your presentation. For items that you cannot get such as beakers, flasks etc. check with your instructor to see if he has them available. Plan ahead, you may not read it verbatim at the time of your presentation (consider using Power Point or overheads). Be sure to have copies of your lesson plan for the instructor.

Suggestions: Write for a person of your intelligence. Have someone read and critique your materials prior to your presentation. Ideas for your presentation can come from books (elementary science textbooks), journals (Science and Children), websites, and practicing elementary teachers. **DO NOT COPY DIRECTLY FROM ANY SOURCE. Cite all references that you have used.**

FORMAT FOR LESSON PLAN ON COURSE CD

Assignment #5 Learning Center Instructions/Lesson Plan

Construct a self-guided, self-paced Science Learning Center designed for either enrichment or remediation of a single science concept. Provide a set of instructions on constructing your Science/Health Learning Center as well as the learning objectives and assessment piece for the students that use the center. Centers will be presented to the entire class.

Assignment #6 Unit Plan-Final Examination

Submit a series of lesson plans that would comprise a unit of instruction in either science or health. We will be using UBD as a format to construct the Unit Plan. Unit plan is a sequence of lessons that teaches a broad topic. The unit is to contain a minimum of 4 lessons **and** an assessment piece that can be a test/quiz/performance piece. The unit will be presented to the entire class.

Course Calendar

Date	Topic	Readings	Assignment Due Date	Activity
Jan 11	Course Introduction-Class calendar- History of Science Education	Ch 1 Carin		Private Universe
Jan 18	Nature of Science, NCLB, PA Standards; Lab Safety PA Assessment Anchors, Keystone Exams	Ch 1 & 3 Carin		Flinn Safety Video
Jan 25	Introduction to teaching methodologies Writing lesson objectives Planning the lesson KWL-THC	Ch 5 Carin Bloom's Taxonomy Wheel	Safety Poster	Batteries & Bulbs
Feb 1	Inquiry Instructional Strategies I Learning Cycle, 5 E model & Inquiry Matrix Questioning strategies	Ch 2 & 4 Carin MOS Ch 7 5E article Matrix Questioning Booklet	Lesson Objectives	Minds of our Own video
Feb 8	Inquiry Lesson Presentation #1	Carin Part B (Assigned topic)	Lesson outline	
Feb 15	Inquiry Lesson Presentation #1	Carin Part B (Assigned topic)	Lesson Outline	
Feb 22	Exemplary Science Programs: FOSS, GEMS, STS	Science for All Children (on line)		Science Kits
Mar 1	Understanding By Design What are the Big Ideas?	Ch 6 Carin UBD Ch. 1 & 2		
Mar 7-12	Spring Break			
Mar 15	Lesson Planning Writing Essential Questions	Dr. Woodson article Ch 6 & 7 Carin UBD Ch. 4		
Mar 22	UBD phase 3 Assessment & Rubrics	UBD Ch. 5 & 6 Ch 6 Carin		
Mar 29	Learning Center Presentation		LC report	
Apr 5	Inquiry Lesson Presentation #2	(Approved topic)	Lesson Plan	
April 12	Inquiry Lesson Presentation #2	(Approved topic)	Lesson Plan	
April 19	Unit planning	UBD Ch 9 & 11		
April 26	Unit Plan Presentation		Unit Plan	
May 3	Unit Plan Presentation		Unit Plan	

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