



Education 343/543
Spring Semester, 2009

**Integrated Methods III:
Teaching Mathematics, Science and Health
in Early Childhood/Elementary/Middle School Education
Pacific University College of Education (4 credit hours)**



Faculty:

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Course website: <http://fg.ed.pacificu.edu/charlesm/courses/mathsci/index.html>

Course Prerequisites: Admission to the College of Education authorization program, or instructors' consent.

Conceptual Framework: This course establishes a risk-free community of learners around the often anxiety-producing topics of mathematics, science, and health. It introduces aspiring early childhood, elementary, and middle school educators to the theories, strategies, resources, and technology applications appropriate to mathematics, science, and health methodology. It emphasizes the linkage to state and national standards, integrated curriculum design, and developmentally appropriate pedagogy with an emphasis on inquiry-based student centered learning. The course includes the contribution of underrepresented groups and multiple cultures to these fields.

Course Goals: To provide preservice early childhood, elementary, and middle school teachers with:

- ✦ an investigation of various methods and models for teaching science, mathematics and health to children;
- ✦ a study and review of selected mathematics, science, and health content;
- ✦ a study of materials, equipment, manipulatives, software and other resources for appropriate instructional applications for teaching mathematics, science, and health;
- ✦ an opportunity to plan and deliver lessons to peers in order to gain confidence and experience with teaching strategies;
- ✦ an awareness and understanding of recent curricular innovations and current instructional issues in science, mathematics and health education;
- ✦ an examination of the interaction between content areas with an emphasis on interdisciplinary teaching.

Course structure/approach:

This course is taught through a mixture of teacher presentation and hands on laboratory activities and explorations with an emphasis on inquiry-based approaches.

Requirements:

1. Attend all classes. Due to the highly interactive nature of this course and its comprehensive assessments, missing any class time is problematic. If you must miss class, talk with the instructor(s) in advance. Any class missed may require written make-up work. Missing class and/or tardies may result in a lower grade for the course.
2. Do all assigned readings so that you are prepared for class discussions with notes, comments and/or questions.
3. Complete all written assignments (typed) which must be maintained in a ring binder when returned to be able to draw from for portfolio development. Late assignments will receive a reduced grade.
4. There will be one mid-term exam. A mini-portfolio will be completed as a final assessment.
5. Attend one professional conference, and write a summary. (Graduate credit only)

Textbooks:

1. Cathcart et al: Learning Mathematics in Elementary and Middle Schools, 3rd or 4th ed., Pearson Merrill Prentice-Hall, Brooks/Cole, 2003/2006.
2. Llewellyn, D. (2007). Inquire within: Implementing inquiry-based science standards in grades 3-8 (2nd Ed.). Thousand Oaks: Corwin Press.
3. Pearce, C. (1999). Nurturing inquiry: Real science for the elementary classroom. Portsmouth, NH: Heinemann.

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Special Needs:

It is our intent to fully include persons with special needs in this course. Please let us know if you need any special accommodations in the curriculum, instruction, or assessment to enable you to participate fully. We will make every effort to maintain the confidentiality of any information you share with us.

University and College of Education Policies

Be aware of the Pacific University Code of Academic Conduct and the College of Education policies for professional behavior and the competent and ethical performance of educators. In this course students are expected to demonstrate behavior consistent with the Professional and Academic Standards in the College of Education.

All University policies are described in more detail at <http://www.pacificu.edu/catalog/index.php#policies> (Search page for key words such as "disabilities"). All College of Education policies are described in more detail at <http://www.pacificu.edu/catalog/college.php?id=2> (Click on the link to "policies" at the top of the page).

Students With Disabilities

In general, the University will work with students to improve conditions that may hinder their learning. The university requires appropriate documentation of a disability in order to enable students to meet academic standards. It is the responsibility of each student to inform the Director of Learning Support Services of his or her disability. Students are encouraged to work with faculty proactively in developing strategies for accommodation.

Incompletes

Instructors may issue a grade of incomplete only when the major portion of a course has been completed satisfactorily, but health or other emergency reasons prevent the student from finishing all the requirements in the course. The instructor and the student should agree upon a deadline by which all work will be completed, with the following guidelines:

1. Incompletes given for Fall and or Winter III terms must be completed by the following April 15.
2. Incompletes given for Spring semester must be completed by the following November 15.

Instructors will issue the grade the student would have earned by not completing the course, preceded by an "I". This grade is determined by including a failing grade for the missing assignment(s) in the calculation of the final grade. If the agreed upon course work is not completed in the period allotted and an extension has not been granted, the grade issued will be permanent. The contingency grade will be used in the computation of the GPA until such time as a new grade is recorded.

Grade Changes

Once a grade is submitted to the Registrar it shall not be changed except in the case of recording errors. The appropriate Dean or Director will approve grade changes.

Safe Environment Policy

Pacific University's Rights and Responsibilities policy seeks to maintain conditions favorable to learning. Students have the right to pursue an education free from discrimination based on gender, religion, marital status, age, sexual orientation or handicap. Students have the responsibility to conduct themselves, both individually and in groups, in a manner which promotes an atmosphere conducive to teaching, studying and learning.

Academic Integrity

Honesty and integrity are expected of all students in class preparation, examinations, assignments, practicums and other academic work. Misconduct includes, but is not limited to cheating; plagiarism; forgery; fabrication; theft of instructional materials or tests; unauthorized access or manipulation of laboratory or clinic equipment or computer programs; alteration of grade books, clinical records, files or computer grades; misuse of research data in reporting results; use of personal relationships to gain grades

or favors or other attempts to obtain grades or credit through fraudulent means; unprofessional conduct related to student care; threats to University personnel and conduct inconsistent with academic integrity. The complete policy, definitions and appeal procedures are described in the *Pacific University online catalog* (see links above).

Assessment:

Incorporates multiple means of assessment including reflective papers, microteaching, midterm exams, and student portfolios. Scores on assignments will be based on the scoring guide below.

Integrated Methods III Scoring Guide	
5	a) Work is both thoughtful and insightful b) Distinctive and sophisticated application of knowledge and skills is demonstrated c) Work consists of professional quality writing (punctuation, grammar, spelling, word usage)
4	d) Work is clear and well-organized e) Application of essential knowledge and skills is present f) Minor composition errors are present (punctuation, grammar, spelling, word usage)
3	g) Errors or omissions detract from the overall quality h) Partial application of knowledge and skills is demonstrated. i) Frequent composition errors are present (punctuation, grammar, spelling, word usage)
2	j) Assignment is not complete k) Work is superficial, fragmented, or incomplete and needs significant development l) Errors or omissions are significant
1	m) Little or no application of knowledge and skills is demonstrated n) Major errors or omissions are present
NE	o) No evidence is provided

Many assignments use this same scale in multiples. For example, an assignment with 20 points possible that scores at the "4" level on this rubric earns 16 points.

We expect all assignments to be completed on time; work turned in late is subject to a reduction of at least one point on the scoring rubric above.

The total points scored will be used to determine semester grades according to the following table:

<u>Grade</u>	<u>Minimum Percentage</u>	<u>Grade</u>	<u>Minimum Percentage</u>
A	90 %	B-	77%
A-	87%	C+	73%
B+	83%	C	70%
B	80%		

Assignment Schedule

Week	Date	Class Topics	Assignments
1	Feb 3	<ul style="list-style-type: none"> - Turtle geometry - Discrepant Events - Syllabus distributed 	
2	Feb. 10	<ul style="list-style-type: none"> - Course Introduction - Problem solving and the NCTM Standards - Inquiring Within and Without 	Write Math/Science Autobiography (C) Review Syllabus and Assignment Guidelines carefully-bring questions to next class Read "Revolution in one Classroom" article
3	Feb. 17	<ul style="list-style-type: none"> - Inquiring With Fruit - Number Sense 	Read Ch. 1-3 (Cathcart) Start School Survey (E) due April 14 Start Library Report (G) due March 3
4	Feb. 24	<ul style="list-style-type: none"> - Numeration systems - Teaching Space Science Topics 	Read Ch. 5 & 6 (Cathcart) Do Math Reflection #1 (A) Work through <i>Sharpening and Deepening Your Definition of Inquiry</i>
5	Mar 3	<ul style="list-style-type: none"> - Whole Number Operations - Applying Inquiry-based Science 	Library Report (G) Work through <i>Extending and Evaluating Inquiry and Ice Hands</i>
6	Mar 10	<ul style="list-style-type: none"> - Lesson objectives - Share Cycle I Work - Measurement and Metrics 	Read Ch. 7-8 (Cathcart) <i>Becoming an Inquiry Science Teacher Cycle 1 Evaluation</i> (B)
7	Mar 17	<ul style="list-style-type: none"> - Science - Estimation - Fractions 	Read Ch. 15 (Cathcart) Read Ch. 9, 10, & 11 (Cathcart) Do Math Reflection #2 (A)
	Mar. 24	<i>Spring Break</i>	
8	Mar 31	<ul style="list-style-type: none"> - Review - Mid-Term Exam 	
9	April 7	<ul style="list-style-type: none"> - Pillbugs - Curriculum resources - Data analysis and prob. 	View Video "Choose a Method" and do Video Reflection #1 (AV) on Blackboard Write Conference Report (H--Graduate only) due May 5
10	April 14	<ul style="list-style-type: none"> - Light, Color, Vision - Math Assessment - Lesson Samplers 	School Survey (E) Read Ch. 16 (Cathcart) Prepare Lesson Samplers (D) Work through <i>What Are the Different Levels of Inquiry?</i>
11	April 21	<ul style="list-style-type: none"> - Inquiry-based Science - Intro to Health Curricula - Integrated M/S/H digital video project overview 	Read Ch. 4 (Cathcart) View Video "Shapes from Squares" and do Video Reflection #2 (AV) on Blackboard Work through <i>Growing Our Rationale for Inquiry</i> Work through <i>Cycle 2 Performance Tasks</i>
12	April 28	<ul style="list-style-type: none"> - Bug-O-Copters - MicroTeaching 	Read Ch. 13 (Cathcart) <i>Cycle 2 Evidence of Learning</i> (B) Prepare MicroTeaching (F)
13	May 5	<ul style="list-style-type: none"> - Intro. to Geometry - Assessing scientific inquiry - Portfolio overview 	Read Ch. 12 & 14 (Cathcart) <i>Cycle 3</i> (B) Conference Report (H--Graduate only)
14	May 12	<ul style="list-style-type: none"> - Sensitive Issues in Oregon - Math Investigations 	Do Resource Purchase (I) View Video "The Missing Link" on Blackboard Do Video Ref. #3 (AV) OR Math Ref. #3 on Ch 4, 12, 13, 14, 16 OR 17(A)
15	May 19	Integrated M/S/H digital video premieres Following children's ideas in math	Portfolio (J) due Wed. May 15 by 5 PM Math/Science/Health Integration project (K) due in class

