



Saili Le Atamai

ACADEMIC AFFAIRS DIVISION
Office of the Dean of Academic Affairs

INSTRUCTIONAL COURSE APPROVAL FORM

Date _____

Course Title **ELEMENTARY SCIENCE METHODS**

Course Code (Alpha and Number) **ED 335**

ROUTING SIGNATURES AND DATE

1. Initiator _____

2. Academic Department Chair: _____

3. Dean, Academic Affairs: _____

4. Curriculum Committee: _____

5. Dean, Academic Affairs: _____

6. Vice President: _____

Approved Disapproved Approved with the following recommendations:

**AMERICAN SAMOA COMMUNITY COLLEGE
INSTRUCTIONAL COURSE APPROVAL FORM**

Department: Education **Instructor:** _____

Course Alpha/Number: ED 335 Course Title: Elementary Science
Methods

Check One: New Course Proposal Course Revision

Total Credits: 4 Lecture: Laboratory Maximum Class Size: 25

CATALOG COURSE DESCRIPTION:

ED 335 uses reading, case studies, instructional technology, and a school-based practicum to educate pre service and in service teachers about K-8 science curriculum and pedagogy. The course seeks to help students develop an understanding and appreciation of science and technology education, and the ability to help children acquire knowledge, attitudes, and skills essential to science and technology literacy.

COURSE RATIONALE:

This is a mandatory “content” course for all prospective teachers and is designed to enhance the teacher’s ability to provide quality science instruction, based on National Standards, for K through 8 teachers.

Part One of the course (7 weeks) examines the nature of science, history and goals of science education, research on science learning, and constructivist frameworks for curriculum and instruction. Course readings, case studies, videotapes of instruction, cooperative learning, and class discussion are used to develop students’ understanding. Part One begins with an introduction to using the internet as a research tool (to be integrated throughout the course) and an introduction to the National Standards for Science Education.

Part Two (7 weeks) uses this foundation to address curricular approaches, diversity and equity, professional resources, instructional technology, children’s literature, classroom management, safety, and assessment. Here students will apply, evaluate, and reflect upon elementary science teaching methods through class activities and field experience assignments. Part Two will also include a continued focus on the application of internet resources as integral teaching and learning tools. Students will design and develop interactive classroom experiments and demonstrations, supported by standard lesson plans, to fulfill the practicum requirement for this course. All students will maintain field experience journals.

The instructor will provide an electronic syllabus with links to web resources. Links to websites that serve the course objectives will be provided in the course calendar according to the topics and objectives explored on a given day.

PRE-REQUISITE(S):

ED 300, ED 310

Textbook(s) / Reference book(s)

Primary Science: Taking the Plunge.
Heinemann Wynne Harlen. 1985

National Science Education Standards.
National Research Council, National Academy Press. 1996

How People Learn: Brain, Mind, Experience and School.
John D. Bransford, Ann L. Brown, and Rodney R. Cocking,
Editors. Committee on Developments in the Science
Learning. 1999. National Research Council. National
Academy Press, Washington D.C.

Approval of Textbook

Department Chairperson

Curriculum Committee

Dean of Academic Affairs

Special supplies / Equipment

Computer and internet access

Approval for Supplies / Equipment

Department Chairperson

Curriculum Committee

Dean of Academic Affairs

COURSE OBJECTIVES IN BEHAVIORAL TERMS

Student Competencies

Upon successful completion of this course, students will be able to:

- 1.1 An understanding of recent trends in science education policy and goals;
- 1.2 An understanding of the compatibility between science studies (history, philosophy, and sociology of science), constructivist learning theory, and practices that promote science literacy;
- 1.3 An awareness of the diversity of curricular approaches available to elementary science educators, including environmental, inquiry, and interdisciplinary curricula;
- 1.4 An ability to design science lessons and units that are developmentally appropriate and sensitive to the needs, values, and interests of a diverse group of students;
- 1.5 An ability to construct assessment plans that are compatible with teaching goals and methods. Also, that allow for multiple ways of representing knowledge;

- 1.6 An ability to use diagnostic observation skills, instructional strategies, and classroom management techniques to promote science learning in small group or whole-class settings;
- 1.7 An ability to use multimedia technologies and trade books to support meaningful learning;
- 1.8 An awareness of organizations and resources (human, environmental, and technological) that serve the professional development of elementary science teachers;
- 1.9 An ability to establish rules and procedures that ensure the physical safety of children;
- 1.10 An understanding of the role of reflection in professional development and lifelong learning.

TOPICAL COURSE OUTLINE

Course Outline:

- 1.0 Introduction to the Internet
 - 1.1 “Googling” for Teaching Resources
 - 1.2 Adapting Resource Materials for Classroom Use
- 2.0 Introduction to the National Science Education Standards, Pacific Regional Standards and ASDOE Standards
 - 2.1 Standards for Primary, Elementary, and Middle School Science Instruction
 - 2.2 Aligning Instruction with Standards
- 3.0 Equity, Diversity, and Gender Bias in the Science Classroom
 - 3.1 “No Child Left Behind”
 - 3.2 Learning Styles
 - 3.3 Designing Learning Activities to Include Diverse Learning Styles
- 4.0 Children’s Ideas in Science
 - 4.1 Applications to Everyday Life
 - 4.2 Categorizing
 - 4.3 Cooking is Chemistry
 - 4.4 The Physical World (Physics, Electricity)
- 5.0 Constructivism and the Nature of Science-Laws are Laws for a Reason

- 6.0 Questioning and Inquiry-Based Science Lessons
 - 6.1 Developing and Implementing Lesson Plans
 - 6.2 Developing and Implementing Appropriate Classroom “Labs”
- 7.0 Science Content Standards for Grades K-8
 - 7.1 Application of Primary Standards to Classroom Instruction
 - 7.2 Application of Elementary Standards to Classroom Instruction
 - 7.3 Application of Middle School Standards to Classroom Instruction
- 8.0 Helping Children to Design Investigations (Life Science)
 - 8.1 Using the Environment as a Life Science Lab
 - 8.2 Cooperative Learning in Life Science
- 9.0 Language and Communication in Science Classrooms
 - 9.1 The Vocabulary of Scientific Inquiry
 - 9.2 Building Understanding Through Discussion of Labs
- 10.0 Assessing Science Learning
 - 10.1 Deciding What Should be Assessed
 - 10.2 Teacher-Made Tests
 - 10.3 Local and National Assessment Standards
- 11.0 Environmental Education
 - 11.1 Pollution
 - 11.2 “Water Everywhere and not a Drop to Drink”
 - 11.3 Classroom Activities and Labs
- 12.0 Integrated Curricula and Thematic Approaches
 - 12.1 Developing Thematic Units with Integrated Lesson Planning
 - 12.2 Classroom Activities and Labs
- 13.0 Safety in the Elementary Science Classroom
 - 13.1 Working With What You’ve Got-Safely
 - 13.2 Developing Age-Appropriate Labs and Lessons
 - 13.3 Safety Guidelines
- 14.0 Using the Internet to Support Professional Development
 - 14.1 What You Know is Never Enough
 - 14.2 Internet Resources for Continuing Science Education
 - 14.3 New Horizons

15.0 Instructional Technology

15.1 Locating and Using Media Resources

15.2 Integrating Computers and Other Technology Resources

ED 355P Elementary Science Methods Practicum

The practicum enables students to observe and interact with students and teachers, to develop and teach science lessons, and to reflect upon the effectiveness of curricula and methods explored in course readings and class discussions. In pursuing the field experience, students are expected to be professional and to reflect upon and learn from their teaching, not to prepare or teach perfect lessons (assuming such things exist). To promote learning and reflection during the field experience, all students are required to maintain a practicum field experience journal, develop and teach science lessons, and submit revised lesson plans after reflecting upon their teaching and the feedback they receive. The field experience assignments are explained below.

Science Lessons

- Each student, working with a partner, will prepare two lessons that address a concept within the state or national science standards. Students must discuss this assignment with the instructor and a cooperating teacher and select a topic for the lessons. Once the topic has been approved, each student must type and submit one of these lessons. After the cooperating teacher (if students are not in service teachers) and the instructor have approved the lesson plans, students will arrange with the teacher to teach one or both of the lessons with the partner. Students are also required to reflect upon their teaching and the feedback from the instructor and cooperating teacher and revise the lesson plan. Students will submit the revised lesson plan (along with the original) individually anytime after the teaching experience, but before the 12th week of the semester.
- Additional lesson plans will be developed and tested throughout the semester. All students should prepare lesson plans using the format shown in the lesson plan guide (provided by the instructor). Although lesson plans are developed collaboratively, work is submitted and evaluated individually. The following examples of Science lesson plans are available online:
 - Lesson plan on the Nature of Science (students will do this lesson in class)
 - Lesson plan on the topic of Weather.
 - A collection of lessons in Physical Science that can be downloaded for Mac or Windows.

Field Experience Journal

- The field experience journal is a professional conversation between instructor and student designed to help students integrate theory and practice in a coherent whole. The journal has several instructional purposes:
 - To explore the relationships between practical and formal knowledge, conception and reality, and action and reflection;
 - To learn strategies to manage these tensions productively;
 - To learn how intentional reflection can play a role in the development of an integrated, professional practice.
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EVALUATION METHODS

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| Research Projects..... | 20% |
| Exam 1..... | 20% |
| Exam 2..... | 20% |
| Practicum..... | 30% |
| Field Experience..... | 10% |