

Northern Marianas College
CURRICULUM ACTION REQUEST

Effective Semester / Session: Spring 2007

Type of Action:

- New
- Modification
- Move to Inactive (Stop Out)
- Cancellation

Course Alpha and Number: ED 433

Course Title: Science Inquiry Methods

Reason for initiating, revising, or canceling:

In response to the need to formalize and improve assessment of student learning, the course guide has been modified to include Section 10: Assessment Measures.

Amy Bohman

Proposer

Date

Michael Reber

Department Chair

Date

English and Format Reviewer

Date

Dean of Academic Programs and Services

Date

Northern Marianas College

Course Guide

Course: ED 433 Science Inquiry Methodology

1. Department

School of Education

2. Purpose

Students need to master inquiry strategies to be successful in all aspects of learning. Additionally, teachers need methods and techniques to help students relate their natural environment to themselves in an interdisciplinary manner. ED 433 Science Inquiry Methods provides an intensive examination of science content through a supportive experiential learning environment. It also offers the teacher-in-training the opportunity to gain an understanding of the development of children's thinking by planning and guiding out student-directed science exploration.

3. Description

A. Required/Recommended Textbook(s) and Related Materials

Required:

Bass, Joel, Carin, Arthur, and Terry Contant. Teaching Science as Inquiry. Upper Saddle River, NJ: Pearson, 2005.

Readability level: Grade 12

B. Contact Hours

1. **Lecture:** 3 hours per week / 45 hours per semester

C. Credits

1. **Number:** 3

2. **Type:** Regular Degree Credits

D. Catalogue Course Description

This course provides the skills, concepts, and content needed to teach science to elementary school children in ways that make science personally relevant. It provides the teacher-in-training with experience in planning, developing, and conducting interdisciplinary science investigations. Concepts covered include project planning, presentation strategies, group management, and the inquiry process. Prerequisites: All core course and general education requirements with a grade of 'C' or better plus ED 300, ED 351, and ED 370 or permission of the Director of the School of Education. Math Placement Level: MA 161.

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E. Degree or Certificate Requirements Met by Course

This is a required course for all BS Elementary Education majors.

F. Course Activities and Design

This course is designed to incorporate lectures, demonstrations, assigned projects, a term paper, and reflection paper. As part of the field experience, students will be required to teach a supervised environmental and life science unit in a local elementary school. Performance-based skills from the projects will be evaluated by the instructor and other class members during classroom critiques.

4. Course Prerequisite(s); Concurrent Course Enrollment; Required English/Mathematics Placement Level(s)

Prerequisites: All core course and general education requirements with a grade of 'C' or better plus ED 300, ED 351, and ED 370 or permission of the Director of the School of Education. Math Placement Level: MA 161.

5. Estimated Cost of Course; Instructional Resources Needed

Cost to the Student: Tuition for a three-credit course, cost of textbook, and instructional materials fee.

Cost to the College: Instructor's salary.

Instructional resources needed for this course include TV/VCR, laptop computer, computer projector, chalkboard, chalk, CRC materials, photocopied materials and various other consumable materials as necessary.

6. Method of Evaluation

Student grades will be based on the regular letter grade system as described below:

- A: Excellent – grade points: 4.0;
- B: Above average – grade points: 3.0;
- C: Average – grade points: 2.0;
- D: Below average – grade points: 1.0;
- F: Failure – grade points: 0.0.

NMC's grading and attendance policies will be followed.

7. Course Outline

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This is a topical outline and does not necessarily indicate the sequence in which the material will be presented.

- 1.0 The importance of studying science
 - 1.1 The role science plays in everyday life
 - 1.2 How science changes over time
 - 1.3 Valuable knowledge for all people
2. Learning science with understanding
 - 2.1 How children learn
 - 2.2 Children's alternative conceptions
 - 2.3 Learning and cognitive development
- 3.0 Processes of science and scientific inquiry
 - 3.1 Importance of processes
 - 3.2 Incorporating scientific processes into scientific investigations
- 4.0 Teaching science through inquiry
 - 4.1 Key elements of inquiry instruction
 - 4.2 Models of inquiry instruction
 - 4.3 Selecting instructional approaches
 - 4.4 Questioning strategies for inquiry teaching
- 5.0 Preparing for inquiry instruction
 - 5.1 Current standards and benchmarks
 - 5.1 Designing inquiry lessons
 - 5.2 Arranging the science classroom
 - 5.3 Grouping students for learning
 - 5.4 Safety in the science classroom
 - 5.5 Classroom discipline
 - 5.6 Implementing learning activities and experiments
- 6.0 Connecting science with other subjects
 - 6.1 Curriculum integration
 - 6.2 Creating integrated science units and lesson plans

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7.0 Assessing Science Learning

- 7.1 Designing performance tasks
- 7.2 Science assessment measures

8.0 Science for all learners

- 8.1 Students with special learning needs
- 8.2 Fostering the learning and acceptance of all students

9.0 Technology in science

- 9.1 Discoveries
- 9.2 Technological advancement
- 9.3 Educational technology utilization the classroom

8. **Instructional Goals**

This course will introduce students to:

- 1.0 Value in studying science;
- 2.0 Processes of science and scientific inquiry;
- 3.0 Instructional practices and preparation for teaching science through inquiry;
- 4.0 Developing and creating standard based integrated curriculum units, lesson plans, activities and/or experiments; and
- 5.0 Influences of technology in science; and
- 6.0 Effective assessment measures for science.

9. **Student Learning Outcomes**

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

- 1.0 Explain the importance of studying science for all students;
- 2.0 Demonstrate the processes of science and scientific inquiry;
- 3.0 Design and implement instructional practices and preparation for teaching science through inquiry;

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- 4.0 Develop and create standard based integrated curriculum units, lesson plans, activities, and or experiments;
- 5.0 Explain the influences of technology in science; and
- 6.0 Demonstrate effective assessment measures for science.

9. Assessment Measures

Assessment of student learning may include, but not be limited to, the following:

- 1.0 Demonstrate understanding through activities, experiments, presentations, participation, lesson plans, and unit plans;
- 2.0 Evaluation by the instructor using provided rubrics;
- 3.0 Quizzes and final examination.