

College of Micronesia-FSM

COURSE OUTLINE

Science Methods	ED304
Course Title	Department and Number

Course Description:

Emphasizes methods of teaching science to elementary school children by use of the island environments and integrating basic science skills into other elementary school curriculum. Practical teaching experiences are included.

Course Prepared by:

Joe Habuchmai	State	National Campus
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	Hours per Week		No. of Week		Total Hours		Semester Credits
Lecture	3	x	16	x	48	=	3
Laboratory	1	x	16	x	16	=	1
Workshop		x		x		=	
							4
Total Semester Credits							

Purpose of Course:

Degree Requirement	
Degree Elective	
Certificate	X
Other	

Prerequisite Course(s): ED210 Introduction to Professional Teaching

Jean Thoulag

Signature, Chairperson, Curriculum Committee

**Date Approved by
Committee**

Spensin James

Signature, President, COM-FSM

Date Approved by President

I. PROGRAM LEARNING OUTCOMES

The student will be able to:

1. Demonstrate and use knowledge of the FSM elementary school curriculum standards.
2. Apply a variety of teaching approaches to meet learning needs of FSM elementary school students.
3. Assess and evaluate learning of the elementary student at both the formative and summative levels.
4. Organize and manage an elementary classroom environment for learning.
5. Demonstrate and use background knowledge in the following areas: learning theories and principles, human development, language development, educational foundations, sociocultural issues and individual and group motivation.
6. Demonstrate professionalism.

II. COURSE OUTCOMES:

A. General :

Upon completion of the course, the student will be able to:

1. Define science and demonstrate the scientific method.
2. Develop a conceptual sense of appropriate science curriculum for Micronesia.
3. Develop a realization of the value of environmental studies in science.
4. Teach conservation and health concepts in Micronesian science curriculum.
5. Teach science as an integrated curriculum activity.

6. Develop understanding of science teaching methodology skills.

B. SPECIFIC:

1. Following lecture each student will be able to explain the differences between science and non-scientific methods and to demonstrate the scientific methods

Student Learning Outcomes	Suggested Assessment Strategies
1a. Define Science.	1a. Student will write the definition of science correctly on the checkout.
1b. Explain the differences between science and religion.	1b. Student will explain the differences between science and religion answering an essay question on a checkout.
1c. Demonstrate understanding of how the Scientific Method works.	1c. Student will write the steps used in Scientific Method on a checkout.

2. Student will be able to describe the scope of the science curriculum in the FSM School system K-8.

Student Learning Outcomes	Suggested Assessment Strategies
2a. Describe the scope and sequence of the standard science curriculum in the FSM States from K-8.	2a. The student will describe the scope and sequence of any of the FSM States science curriculum on a checkout.
2b. Tell the differences between the US National Science Standards and the FSM science standards.	2b. The student will list the differences and similarities between the various science curriculum standards from US and the FSM.

3. Following lecture and demonstration each student will be able to describe graphically the probable geological evolution of his island, in terms of modern theories.

Student Learning Outcomes	Suggested Assessment Strategies
3a. Describe how the islands were formed.	3a. Student will do a research paper which includes an illustration showing how the

	islands were formed.
3b. Enumerate modern theories relating to probable evolution of an island.	3b. Student will explain at least two modern theories relating geological evolution of an island on a test.

4. Each student will identify and prepare a resource inventory in English and vernacular of at least 100 species of plants, birds, reptiles and amphibians, mammals, insects or marine organisms of his/her island environment which could be used for science teaching.

Student Learning Outcomes	Suggested Assessment Strategies
4a. Name plants in English and Vernacular.	4a. Prepare a resource inventory in English and vernacular of at least 100 species of plants.
4b. Name birds, reptiles, amphibians, mammals, and insects in English and Vernacular.	4b. Prepare a resource inventory in English and vernacular of at least 100 birds, reptiles, amphibians, mammals, and insects.
4c. Name marine organisms in English and Vernacular.	4c. Prepare a resource inventory in English and vernacular of at least 100 marine organisms according to their habitat.

5. Following ecology studies, each student will describe, in writing and graphically, ecological interpretations using organisms of his own island environment, terrestrial, marine, or a combination of these, using concern of bio-diversity and food webs.

Student Learning Outcomes	Suggested Assessment Strategies
5a. Student will describe ecological interpretations using organisms of his own island environment.	5a. Student will describe in writing and graphically, ecological interpretations using organisms of his own island environment, terrestrial and marine in relationship with bio-diversity and food webs.

6. Students will create a working science vocabulary and instructional aids suitable for use in elementary school science teaching.

Student Learning Outcomes	Suggested Assessment Strategies
6a. Compile a working science vocabulary for use in science teaching.	6a. Student submits list of working science vocabulary suitable for use in elementary science teaching.
6b. Develop instructional aids for a science classroom.	6b. The student will prepare at least one bulletin board and two charts to illustrate science concepts.

7. Each student will demonstrate six teaching strategies including integration, data, census collecting procedures, measurement, and collection and observation skills.

Student Learning Outcomes	Suggested Assessment Strategies
7a. Develop and teach a lesson on the six teaching strategies in science.	7a. Student teaches integration, data, census collecting procedures, measurement, and collection and observation skills. Instructor evaluates student performance in all six areas by using a rating scale.

8. Following demonstration and practical experience each student will be able to demonstrate at least three ways of using math skills in science lessons.

Student Learning Outcomes	Suggested Assessment Strategies
8a. Develop a lesson plan using math skills in science.	8a. Student teaches a lesson using math skills in science with the peers. Teacher evaluates the student performance using a checklist.

9. Students will be able to design an elementary school science lesson for a specific grade level using one of the following: incorporating measurement, estimation of distance, thermometer reading, English and metric measurement, census taking and extrapolation, and probability.

Student Learning Outcomes	Suggested Assessment Strategies
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<p>9a. Develop and teach a lesson on the following: incorporating measurement, estimation of distance, thermometer reading, English and Metric Measurement, Census taking and extrapolation, and probability.</p>	<p>9a. Teaches a lesson in English with peers on measurement, estimation of distance, thermometer reading, English and Metric Measurement, census taking and extrapolation and probability. Instructor evaluates student's performance using a checklist of a good lesson presentation.</p>
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10. Student will orally express his/her own personal value and attitude towards conservation problem remedies, through simulation exercises in a dramatization.

Student Learning Outcomes	Suggested Assessment Strategies
<p>10a. Discuss conservation and conservation problems orally through drama for presentation.</p>	<p>10a. Student will use puppets to express conservation issues in a theatrical way. Instructor evaluates the performance of the student based on delivery of concept and preparedness.</p>

11. Demonstrate skill in elementary school science lesson planning by writing at least five lesson plans.

Student Learning Outcomes	Suggested Assessment Strategies
<p>11a. Write elementary school science lesson plans.</p>	<p>11a. Student writes at least five elementary school science lesson plans. Instructor grades the student based on the criteria for writing a good lesson plan.</p>

12. Each student will demonstrate his/her recognition and readiness to use at least three different methods of science teaching, such as: lecture, modeling, problem solving, inquiry approach, and data interpretation, of a combined approach.

Student Learning Outcomes	Suggested Assessment Strategies
<p>12a. Demonstrate readiness in using methods of science teaching, such as lecture, modeling, problem</p>	<p>12a. Student teaches using at least three different methods of science teaching. Instructor</p>

solving approach and data interpretation, of a combined approach.	evaluates student performance using a checklist.
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13. If possible, student will demonstrate acquired science teaching skill in practicum experience with elementary school children, including lesson planning, lesson preparation, instruction to children and teaching evaluation by self and instructor.

Student Learning Outcomes	Suggested Assessment Strategies
13a. Teach a lesson using acquired science teaching skills in a practicum experience with Elementary children.	13a. Student teaches at least a lesson using acquired science teaching skills with elementary children.

14. Students will demonstrate a method of instruction at appropriate grade levels of the following: water cycles, nitrogen cycles, weather and climate, elements of the planet, chemical and physical change, sensory learning.

Student Learning Outcomes	Suggested Assessment Strategies
14a. Identify a method of instruction to be used in teaching water cycles, nitrogen cycles, weather and climate, elements of the planet, chemical and physical and sensory learning.	14a. Student submits to the instructor a paper listing methods of instruction of the following: water cycles, nitrogen cycles, weather and climate, chemical and physical and sensory learning. Instructor evaluates the method used for each topic.

III. COURSE CONTENT

1. Knowledge of Student’s Island Environment.
 - A. Definition of Science.
 1. Differences between science and non-scientific methods.
 2. Scientific Method
 - B. FSM and US Science Curriculum Standards
 1. U.S. Science Curriculum Standards
 2. FSM Science Curriculum Standards
 - C. Modern theories of island geology.
 1. Teutonic plate movement and effects on the Pacific basin.

2. Taxonomy of islands: volcanic, atoll, makatea, continental and mixed.
 3. Type of island rocks, minerals & soils.
 4. Documenting a specific island environmental resource.
- D. Resource Inventories.
1. Identifying individual island biological resources useful to science teaching.
 2. Examining island biological life cycles to understand bio-diversity.
 3. Energy flow thru food chains, webs, pyramids.
 4. Effects of introductions to food chains, etc.
2. Science teaching in Elementary schools.
- A. Using island resources.
 - B. Integrating science with other elementary school curriculum: language arts, math, art, physical education, social studies, health.
 - C. Emphasis on use of probability, measurement, data collecting and data interpretation and observation skills.
 - D. Methods of instruction for teaching science; i.e.- lecture, modeling, inquiry approach, with activities.
 - E. Practicum experiences in teaching elementary school science:
 1. Peer experiences.
 2. With children, when possible.
3. Evaluation of ones science teaching & attitude:
- A. Value expression of conservation problems and remedies.
 - B. Organizing a collection of science teaching material.
 - C. Rating self with instructor on science teaching.
 - D. Preparation of a science teaching project, final.

IV. TEXT:

1. Teaching Children Science. A Discovery Approach. 6th Edition or most current edition. Joseph Abruscato, University of Vermont, Copyright 2004.
2. Helping Children Learn Science Curriculum Guide for FSM Elementary Schools The Australian, FSM Science Project 1994-1995.
3. Handouts prepared by Instructor

V. REFERENCES AND APPROPRIATE RESEARCH BOOKS:

1. The Teaching of Science in Tropical Primary Schools by E.D. Joseph UNESCO Handbook, Oxford Press, London.
2. Hawaii Nature Study Project by Sister Ednal Demanchee Ph. D., University of Hawaii Press, Honolulu, Hawaii.
3. Nature Activities & Conservation, Field Guide by William Hillcourt; Pub. P. Putnamsons, New York, 1981.
4. Guide to Pacific Wetland Plants, Lani Stemmermann, Pub. U.S. Army Corps of Engineers, Honolulu District, 1981.
5. Birds of Micronesia, by Harvey G. Segal College of Micronesia, Pub. Good News Press, Pohnpei, Eastern Caroline Islands, 1986.
6. Hawaii Reptiles and Amphibians by Sean McKeoun, Honolulu 200, Oriental Pub. Co., Honolulu, Hawaii, 1985 revision.
7. FAST Science curriculum materials.
8. Project learning Tree published by U.S. Forestry Service.
9. Poisonous Plants of Paradise by Susan Scott and Carig Thomas, M.D., University of Hawaii Press, Honolulu, 2000.
10. Flowers of the Pacific Island Seashore, A Guide to the Littoral Plants of Hawaii, Samoa, Tonga, Cook Islands, and Fiji, Whistler, Arthur, Published by Isle Botanica, 1992.

11. The Pacific Islands: Environment & Society. Rapaport, Moshe. 1999.

12. Tropical Pacific Island Environments. Lobban, S. C. and M. Schefter. Guam University Press, 1997.

VI. INSTITUTIONAL COSTS:

Minimal: rulers, compass, thermometers, magnifying glasses, graph paper. \$25-35 per student.

VII. METHODS OF INSTRUCTION:

- Class lecture and demonstration.
- Group activities, including field trips & outdoor activities.
- Individual Projects and group projects integrating science curriculum.
- Peer Group Teaching.
- Practice teaching with elementary school children.

VIII. SUGGESTED METHOD OF EVALUATION:

A. The A, B, C, D, F, grading system as defined in the COM-FSM college grading policy will be adhered to. Final grade will be based on:

- 1. Participation & attendance 25%
- 2. Completion of all objectives..... 25%
- 3. Method demonstrations 25%
- 4. Final Checkout, including notebook 25%

IX. CREDIT-BY-EXAMINATION: none

X. ATTENDANCE POLICY

The College of Micronesia-FSM attendance policy applies to this course.

XI. ACDEMIC HONESTY POLICY

The College of Micronesia-FSM academic honesty policy applies to this course.

