College of Micronesia-FSM
P. O. Box 159
Kolonia, Pohnpei FM 96941

Course Outline Cover Page

Math Methods	Education: ED 303
Course Title	Department and Number

Course Description: The course presents objective, methods and materials for teaching mathematics in elementary schools. The student is taught to use a variety of procedures and methods through participation in activities stressing planning and simulated teaching on several levels within the elementary system.

Course Prepared by: Joe Habuchmai   State   COM-FSM main campus

	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		=	

Total Semester   Credits   4

Purpose of Course:
Degree Requirement	
Degree Elective	
Certificate	X
Remedial	
Other	

Prerequisite Course(s):   None.

Jean Thoulag
Signature, Chairperson, Curriculum Committee   **Date Approved by Committee**

Spensin James
Signature, President, COM-FSM   **Date Approved by President**

I. LEARNING OUTCOMES

A. Program Learning Outcomes

Students completing the Third-year Certificate of Achievement in Teacher Preparation-Elementary will be expected to demonstrate the following competencies:

1) Demonstrate comprehension and application 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 comprehension and application of learning theories and principles, human development, language development, educational foundations, socio-cultural issues and strategies for teaching students with special needs.
6) Demonstrate professionalism.

B. Course Learning Outcomes

General

The value of any mathematics methods course provided for any level of teaching is determined by the future teacher's ability to understand thoroughly what is to be taught and to be sufficiently trained to set up learning situations.

The student will be able to:

1. Describe the vision, characteristics, philosophy, and content of an effective contemporary, mathematics compared to a traditional program.

2. Demonstrate understanding of NCTM Professional Standards, positive classroom environment, lesson objectives, lesson organization and planning for teaching mathematics.

3. Describe the vision of mathematics, assessment techniques and types of mathematics standards test used for teaching math to children.

4. Do problem-solving, decision making and communicating skills in mathematics.

5. Use numeration, number sense, and place value to demonstrate the skills through peer teaching and student teaching at the elementary school classroom.

6. Demonstrate various models or skills in teaching addition, subtraction, multiplication, and division of whole numbers to elementary children.

7. Classify counting numbers as prime and composite, write prime factorization, calculate least common multiple and greatest common fact for a given set of counting numbers, and perform fundamental operations on integers and rational numbers.

8. Develop understanding of non-negative rational numbers expressed as fractions and indicate whether one fraction is less than, equal to or greater than the second fraction.

9. Use models to demonstrate concepts of additions, subtraction, multiplication, and division of fractions.

10. Use models of base ten blocks, regions, money and the number line to develop understanding of decimals and operations on decimals,

write rational number in fraction form, decimal form, scientific and expanded notation, and use ratio and proportion to describe problem situations and to solve percentage problems.

11. Develop lessons in data collection, data analysis, and to use graphs to illustrate its outcomes.

12. Develop and teach lessons on non-standard and standard system of measurement, US Customary and metric systems of measurement.

13. Develop knowledge of geometry terminologies and basic geometric concepts, classify angles, bisect angles and present it to the appropriate grade level.

14. Classify polygons, and simple closed curves, and also calculate perimeters and areas of certain polygons, prisms, cylinders, cones and pyramids and spheres.

SPECIFIC**:**

1. THE student will be able to describe the vision, characteristics, philosophy,   and   content   for   an   effective   contemporary mathematics compared to a more traditional programs.

Student Learning Outcomes	Suggested Assessment Activities
1a. Describe the vision of mathematics education.	1a. The student will describe good vision of mathematics education on a checkout.
1b. Describe the characteristics of a contemporary school mathematics program and compare those with FSM math curriculum.	1b. The student will describe characteristics of contemporary school mathematics program and compared that to the FSM math curriculum on a checkout.
1c. List advantages and disadvantages of a contemporary mathematics	1c. The student will list 5 advantages and 5 disadvantages of a contemporary mathematics

program.	program.
1d. Describe the basic philosophy of teaching mathematics to children.	1d. The student will describe the basic philosophy of teaching mathematics correctly on a checkout.
1e. Describe, in general terms, mathematics content as appropriate for any grade level, K-8.	1e. The student will describe mathematics content as appropriate for grade levels, K-8 on a Checkout.

2.   Demonstrate understanding OF NCTM PROFESSIONAL STANDARDS, POSITIVE CLASSROOM ENIVRONEMENT, LESSON OBJECTIVES, LESSON ORGANIZATION AND PLANNING FOR TEACHING MATHEMATICS.

Student Learning Outcomes	Suggested Assessment Activities
2a. Describe the vision of mathematics teaching by NCTM Professional Standards for teaching mathematics.	2a. Instructor evaluates student knowledge of the vision of mathematics teaching on a test.
2b. List characteristics of a positive classroom environment.	2b. List at least 5 characteristics of a positive classroom environment. Instructor evaluates student using the list stated in the textbook.
2c. Write appropriate objectives for mathematics lessons.	2c. Write good behavioral objectives on a checkout assigned by the instructor.
2d. Write a lesson plan for a given topic or skills in mathematics and organize it to include good student participation.	2d. The student will write a sample lesson plan and be evaluated by the instructor.

3.   THE STUDENT WILL BE ABLE TO DESCRIBE THE VISION OF MATHEMATICS, ASSESSMENT TECHNIQUES AND TYPES OF MATHEMATICS STANDARD TESTS USED FOR TEACHING MATH TO CHILDREN.

Student Learning Outcomes	Suggested Assessment Activities
3a. Describe characteristics of standard assessment techniques.	3a. The student will list good characteristics of standard assessment techniques on a test given by the instructor.
3b. List types of standard test used in Math teaching.	3b. The student will list and explain at least three types of tests used in assessing math skills on a checkout.

4. The student will be able to do problem solving, decision making and communicating skills in Mathematics.

Student Learning Outcomes	Suggested Assessment Activities
4a. Describe the nature of problem solving and the problem solving process.	4a. The student will describe the nature of problem solving and problem solving process on a test.
4b. Write mathematical sentences for solving problems.	4b. The student will write mathematical sentences and solve problems using various algorithm.
4c. Use inductive and deductive approach in problem solving in the classroom.	4c. The student will demonstrate the use of inductive and deductive approach in problem solving through peer teaching.

5. The student will be able to use numeration, number sense, and place value and demonstrate the skills through peer teaching and student teaching at the elementary school classroom.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
5a. Demonstrate various skills in teaching numeration, number	5a. The student will demonstrate skills in teaching numeration,

sense, and place value to children.	number sense, and place value to peers and be evaluated by the instructor using standard form of evaluation.
5b. Use standard notation, expanded notation, and exponential notation for a given number.	5b. The student will develop a poster or chart showing the standard, expanded, and exponential notation for display in the classroom. Instructor evaluates student's work based on clarity of concept, print, and general organization of the content.

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6. The student will be able to demonstrate various models or skills in teaching addition,   subtraction, multiplication, and division of whole numbers to elementary children.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
6a. Describe models used to teach children addition, subtraction, multiplication and division of whole numbers.	6a. The student will demonstrate the different models in teaching addition, subtraction, multiplication, and division of whole numbers to peers. Instructor evaluates student performance by using a rating scale.
6b. Demonstrate various skills in administering timing test in addition, subtraction, multiplication, and divisions of whole numbers.	6b. The student will use various assessment tools to measure children performances on calculating facts. Instructor evaluates student's performances through a checkout
6c. Demonstrate various math algorithm in calculating addition, subtraction, multiplication, and	6c. The student will demonstrate mastery of different algorithm in calculating facts through peer

division.	teaching. Instructor evaluates students performance using a checklist.
6d. Demonstrate regrouping in addition, subtraction, multiplication, and division using place value box.	6d. The student will use place value box to do the skills of regrouping in addition, subtraction, multiplication and division of whole numbers.

7. The student will be able to classify counting numbers as prime and composite, write prime factorization, calculate least common multiple and greatest common factor for a given set of counting numbers, and perform fundamental operations on integers and rational numbers.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
7a. Classify counting numbers as prime or composite	7a. The student will classify counting numbers as prime or composite through peer teaching. Instructor evaluates mastery of student using a checklist.
7b. Write the prime factorization of any given counting numbers.	7b. The student will write prime factorization of any given counting number through peer teaching.
7c. Calculate the greatest common factor and least common multiple for a given set of counting numbers.	7c. The student will calculate the greatest common factor and least common multiple for a given set of counting numbers through peer teaching demonstration.
7d. Demonstrate the rules of divisibility for any given counting numbers.	7d. The student will demonstrate the rules of divisibility for any given counting numbers through peer teaching.
7e. Define the terms integers,	7e. The student will define integers,

rational number, and real number and perform the fundamental operations.	rational number, and real number and perform the fundamental operations through peer teaching. Instructor evaluates student's performances through checklist.

8. The student will be able to develop understanding of nonnegative rational numbers expressed as factions and indicate whether one fraction is less than, equal to or greater than the second fraction.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
8a. Develop understanding of nonnegative rational number expressed as fractions.	8a. The student will write nonnegative rational number expressed as factions through lessons taught through peer teaching. Instructor evaluates student mastery of skills using a checklist.
8b. Write fractions in simplest form and indicate whether one fraction is less than, equal to, or greater than a second fraction.	8b. The student will demonstrate writing fractions in simplest form and indicate whether one fraction is less than, equal to, or greater than a second fraction through peer teaching. Instructor evaluates the student mastery of the skills using rating scale.

9. The student will be able to use models to demonstrate concepts of addition, subtraction, multiplications, and division of fractions.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
9a. Demonstrate concepts of addition, subtraction,	9a. The student will use models like regions, groupings, and number

multiplications and divisions of fractions using region, groups, and number lines.	lines to teach lessons in addition, subtractions, multiplications, and divisions of fractions. Instructor evaluates student performances using rating scales.

10. The student will be able to use models of base ten blocks, regions, money and the number line to develop understanding of decimals and operations on decimals, write rational number in fraction form, decimal form, scientific and expanded notation, and use ratio and proportion to describe problem situations and to solve percentage problems.

The student will be able to:

Student Learning Outcomes	**Suggested Assessment Activities**
10a. Use models like Base ten blocks, regions, money, and the number line to develop understanding of decimals and operations on decimals.	10a. The student will use models like blocks, regions, money and number line to demonstrate lessons on operations on decimals. Instructor evaluates peer teaching lesson using a rating scale.
10b. Write any given rational number in fraction form, decimal form, expanded and scientific notation.	10b. The student will demonstrate a lesson on writing fractional form, decimal form, expanded and scientific notation.
10c. Use ratio and proportion to describe problem situations and to solve percent problems.	The student will use ratio and proportion to describe problem situations through peer teaching. Instructor evaluates student performance through rating scales.

11. The student will be able to develop lessons in data collection, data analysis, and to use graphs to illustrate its outcomes.

The students will be able to:

Student Learning Outcomes	Suggested Assessment Activities
11a. Define the terms range, mean, median, and mode in relationship with data analysis.	11a. The student will teach a lesson on data analysis based on the terms, range, mean, median, and mode. Instructor evaluates student performance using a rating scale.
11b. Determine the possible outcomes from different events using experimental and theoretical probability.	11b. The student will use spinners, coins, probability trees to determine possible outcomes from a sample space through peer teaching.
11c. Develop lessons incorporating graphs, frequency polygon, histogram, bar graphs, line graphs, pictograph, scatter plots, stem-leaf plots for a given set of data.	11c. The student will teach a lesson which will include at least three of the types of graphs. Instructor evaluates student performance using a rating scale.

12.   The student will be able to develop and teach lessons on nonstandard and standard of measurement, US customary and metric systems of measurement.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
12a. Teach a lesson on the metric and the U.S. Customary system of measurement.	12a. The student will develop and teach a lesson on the metric and one on US. Customary system of measurement. Instructor evaluates student performance using a rating scale.
12b. Teach a lesson on money and time concepts to peers.	12b. The student will develop and teach a lesson on money and time concepts to the peers. Instructor evaluates student performance

	using rating scale.

13. The student will be able to develop knowledge of geometry terminologies and basic geometric concepts, classify angles, bisect angles and present it to the appropriate grade level.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
13a. Use correct terminology for basic geometric concepts, classify angles according to their measures, and bisecting given angles.	13a. The student will develop and teach a lesson on geometric terms, classifying angles according to their measures, and bisecting angles. Instructor evaluates performance of student using a rating scale.
13b. Demonstrate correct mathematical notation for figures such as lines, line segments, rays, and angles.	13b. The student will develop and teach a lesson on mathematical notation on lines, line segments, rays, and angles. Instructor evaluates performance of students using a rating scale.

14. The student will be able to classify polygons, and simple closed curves, and also   calculate perimeters and areas of certain polygons, prisms, cylinders, cones, pyramids and spheres.

The student will be able to:

Student Learning Outcomes	Suggested Assessment Activities
14a. Classify polygons and simple closed curves and calculate perimeters and areas prisms, cylinders, cones, circles, pyramids, and spheres.	14a. The student will develop and teach two lessons on classifications of polygons and determining perimeters and areas of prisms, cylinders, cones, circles, pyramids,

	and spheres. Instructor evaluates performance of student using rating scale.
14b. Calculate volume and lateral areas of prism, cones, cylinders, and pyramids, and spheres.	14a. The student will develop and teach a lesson on determining volume and surface areas of prism, cones, cylinders, pyramids and spheres. Instructor evaluates performance of student using a rating scale.

II.   COURSE CONTENT:

1. Learning, teaching, assessing, problem solving, decision making, and

    communicating in mathematics.
2. Numeration, Number Sense and Place Value
3. Addition and Subtraction of Whole Numbers
4. Multiplication and Division of Whole Numbers
5. Number Theory and Number System
6.   Rational Numbers Expressed as Fractions: Concepts and Operations
8.   Rational Numbers Expressed as Decimals: Concepts and Operations
9. Data Analysis: Graphs, Statistics, and Probability
10. Measurement
11. Geometry: Basic Concepts and Structures
12. Geometry: Polygons and Polyhedra

III.   TEXTS:

Today's Mathematics by James W. Heddens, Ninth Edition, Macmillian Publishing Company, 866 Third Avenue, New York 10022, 2002.

Pacific Standards for Excellence in Mathematics Pacific Region Educational Laboratory, 828 Fort Street Mail, Suite 500, Honolulu, HI September 1995.

IV.   REFERENCE MATERIALS:

References: NCTM Standards and FSM Math Standards

V.   METHODS OF INSTRUCTIONS:

- ➤ Class Lecture and demonstration
- ➤ Peer Group Teaching
- ➤ Practice Teaching with elementary school children
- ➤ Individual and Group projects (bulletin board and charts)
- ➤ Portfolio (Notebook)

VI.   EVALUATION:

The student will be graded A, B, C, D, or F depending on how successful s/he meets each unit behavioral objectives as stated in the SLOs. No credit by examination for this course.

- ➤ Class Attendance…………………………………………5%
- ➤ Peer Teaching……………………………………… 40%
- ➤ Practice Teaching with elementary school children….. 10%
- ➤ Checkouts……………………………………………….20%
- ➤ Individual and group projects ………………………... 10%
- ➤ Portfolio (Notebook)…………………………………15%

Total……………………100%

VII. ATTENDANCE POLICY:

COM-FSM Attendance Policy will be followed.

IX. ACADEMIC HONESTY POLICY:

COM-FSM Academic Honesty Policy will be followed.