

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

Course Outline

Course Title	Department and Number
College Algebra	Division of Natural Science and Mathematics MS 101

Course Description: A one semester course covering exponential and logarithmic functions, the graphs of these functions, the inverse relationship between exponentials and logarithms, solving equations involving exponentials and logarithms, and modeling using exponentials. Also includes an introduction trigonometry covering right triangle trigonometry, trigonometric functions of any angle, graphs of sine and cosine functions, modeling using sine and cosine functions, inverse trig functions and solving trigonometric equations.

Course Prepared by: Dennis Gearhart

State/Campus: Pohnpei/National

	Hours per Week		No. of Week		Total Hours		Semester Credits
Lecture	3	x	16	x	48/16	=	3
Laboratory							
Workshop							
Study							
					Total Semester Credits:	=	3

Purpose of Course

Degree Requirement: X

Degree Elective:

Certificate:

Remedial:

Other:

Prerequisite Course: A grade of C or better in MS 100 College Algebra or by placement test.

I. Mathematics Program Outcomes

Students will be able to:

- define mathematical concepts, calculate quantities, estimate solutions, solve problems, represent and interpret mathematical information graphically, and communicate mathematical thoughts and ideas.

- II. **General Objectives** – Students will be able to model and solve equations involving exponential, logarithmic and trigonometric expression
- III. **Special Objectives:** Students will be able to:
- A. **Work with Exponential Functions**
- Evaluate exponential expressions by hand and using technology.
 - Identify the parameters of an exponential function.
 - Identify transformations of exponential functions.
 - Graph exponential functions
 - Define the number e .
 - Calculate interest amounts using compound interest.
 - Calculate interest amounts using continuous compounding.
 - Recognize that a function is growing/decaying exponentially.
- B. **Work with Logarithmic Functions**
- Define the meaning of the logarithm base a
 - Evaluate logarithmic expressions by hand and using technology.
 - Understand the properties of logarithms.
 - Graph logarithmic functions.
 - Recognize transformations of logarithmic functions.
 - Use the change of base formula.
 - Use the properties of logarithms to expand logarithmic expressions.
 - Use the properties of logarithms to condense logarithmic expressions.
 - Explain the inverse relationship between exponential and Logarithms.
- C. **Work with Equations involving exponentials and Logarithms**
- Use logarithms to solve exponential equations.
 - Use exponentials to solve logarithmic equations.
- D. **Work with Exponential and Logarithmic Models**
- Given several data points, model an exponential growth function.
 - Given several data points, model and exponential decay function.
 - Find the doubling time of an exponential growth function.
 - Find the half-life of an exponential decay function,.
 - Use exponentials and logarithms to solve interest problems.
- E. **Work with Angles and Triangle**
- Describe angles
 - Use degree measure
 - Use radian measure
 - Sketch angles in standard position
 - Convert between degree and radian measure
 - Convert between decimal degrees and deg/min/sec format
 - Determine if two angles are coterminal
 - Use the Pythagorean Theorem to find missing sides of triangles

- Determine if a triangle is a right triangle
- Sketch a triangle given any two sides
- Find the six trigonometric ratios of the acute angles in a right triangle
- Construct a 30-60-90 and 45-45-90 triangle from memory
- Use technology to find trigonometric ratios of angles using degrees/radians.
- Find a missing side of a right triangle using a trigonometric ratio
- Model physical situations using right triangles.

F. Work with Trigonometric Ratios

- Define the six trigonometric ratios for angles of any measure, i.e. non-acute angles
- Given a point on the terminal ray of an angle, find the trigonometric ratios of the angle.
- Describe and sketch the unit circle
- Define a reference angle
- Find the reference angle of a given angle
- Evaluate, by hand, the trig ratios of given angles using a reference angle
- Define a periodic function
- Model periodic phenomena using periodic functions
- Define a quadrant angle

G. Work with Graphs of Periodic Functions

- Recognize and sketch graphs of sine and cosine functions and transformations of these functions of the form $y = a \sin (bx) + c$ and $y = a \cos (bx) + c$
- Identify the period, amplitude and midline of a periodic function from its graph
- Identify the period, amplitude and midline of a periodic function from its equation

H. Work with Inverse Trigonometric Functions

- Define the inverse trigonometric functions of sine, cosine and tangent
- Evaluate, by hand, expressions involving inverse trig functions
- Evaluate, using technology, expressions involving inverse trig functions
- Describe the domain and ranges of inverse trigonometric functions
- Apply the inverse properties of trigonometric functions

I. Work with Trigonometric Identities and Relationships

- Use fundamental identities to simplify trigonometric expressions
- Verify trigonometric identities
- Factor trigonometric expressions
- Solve trigonometric equations using algebraic techniques

- Solve trigonometric equations using calculator
- Use the Law of Sines to solve oblique triangles
- Use the Law of Cosines to solve oblique triangles

- IV. **Required Textbook:** Algebra and Trigonometry, Seventh edition, ©2007, ISBN: 0618643213. Larson & Hostetler, [Houghton Mifflin](#)
- V. **Required Course Materials:** Scientific calculator, pencil, notebook.
- VI. **Reference Materials:**
- VII. **Instructional Cost:** None anticipated at this time
- VIII. **Methods of Instruction:** The course will be taught by lecture, class discussion.
- IX. **Evaluation:** Homework, tests, quizzes, and a final exam will be given. A standard 90%=A, 80%=B, 70%=C, 60%=D Below 60%=F grading scale is recommended.
- X. **Credit by Examination:** None
- XI. **Attendance Policy:** As per the current college catalog. Additionally, arriving to class late counts as a one-third absence.