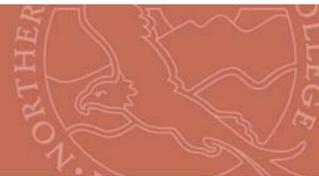# NORTHERN NEW MEXICO COLLEGE

Course Number Course Name	Math 129 Problem Solving Methods
Credit Value (Breakdown of theory and lab credits)	4 Theory
Catalog Course Description	This course presents strategies for solving mathematical problems for non-math majors. Topics include the review of the number system, algebraic graphs and functions, linear and exponential equations, systems of linear equations in two variables, the metric system and conversions and geometry. Prerequisite: MATH 102N. (4,4T+0L)

Student Learning Outcomes/Objectives /Competencies of the Course	**Student Learning Outcomes:** At the end of this course the student will be able to:
	
	 1. Use sorting and counting techniques to solve problems.
	  a. Component 1: Create and use various charts, such as Venn diagrams, tree diagrams, and tables, to organize information and address appropriate counting applications.
	  b. Component 2: Calculate and apply counting methods, which can include the multiplication principle, permutations, combinations and set operations, to solve appropriate real-world situations.
	  c. Component 3: Calculate the probability for single and compound events based on counting methods or probability rules.
	 2. Create and apply algebraic models to solve problems.
	  a. Component 1: Create a linear model given data or given rate of change and an initial value.
	  b. Component 2: Create an exponential model given percent change or half-life or doubling time, or apply the compound interest formula to solve problems as appropriate.
	  c. Component 3: Use linear or exponential models when applicable for a given context.
	  d. Component 4: Recognize and interpret graphs of linear and exponential models.
	 3. Reason inductively to solve problems.
	  a. Component 1: Distinguish between examples of inductive and deductive reasoning.
	  b. Component 2: Use inductive reasoning to identify patterns and solve problems.
	  c. Component 3: Use common notation and terminology associated with sequences.
	  d. Component 4: Determine and use the nth-term formula for arithmetic and geometric sequences in real world situations.
	  e. Component 5: Find and use finite sums of arithmetic and geometric sequences in appropriate applications.
	 4. 4. Use quantitative reasoning to solve problems.

	a. Component 1: Isolate a variable in a formula.
	b. Component 2: Use appropriate units conversions and apply dimensional analyses when needed in problem solving.
	c. Component 3: Apply non-algebraic techniques, such as drawing pictures, performing multiple arithmetic calculations, and using trial and error, to solve problems.
	d. Component 4: Use appropriate notation and terminology when solving problems and communicating answers.
	5. 5. Describe data graphically and numerically to answer questions relative to the distribution of data for a quantity under study.
	    a. Component 1: Represent data using graphs such as histograms, or boxplots, or pie charts.
	    b. Component 2: Interpret graphical displays of data.
	    c. Component 3: Calculate descriptive statistics, including mean, median, quartiles and/or standard deviation, and use them to characterize and interpret data.

College-Wide Student Learning Outcomes	Math 129 learning objectives align with the following NNMC College Wide Goal: *Critical thought:* • *Students are required to analyze and synthesize information and draw reasoned conclusions.*