



**M:** Course Objectives / Learning Outcomes

At the conclusion of this course students will be able to:

- identify and discuss at least three common misconceptions about mathematics
- understand and explain the importance of mathematical literacy in modern society
- reflect on the role that mathematics plays in their own lives
  
- recognize and analyze fallacies in given arguments
- use appropriate logic notation and simple truth tables to analyze the truth values of propositions involving negation, conjunctions, disjunctions, conditionals
- distinguish between inclusive and exclusive uses of the word “or”
- given a conditional, write its converse, its inverse and its contrapositive
- illustrate relationships between sets using Venn diagrams
- solve problems using Venn diagrams to organize information
- use Venn diagrams to test the validity of arguments
- distinguish between inductive and deductive arguments
- apply critical thinking strategies to analyze arguments
  
- know standard metric units of measurement
- perform unit conversions
- apply problem solving strategies to solve word problems
- solve percentage problems
- calculate absolute and relative change
- identify common abuses of percentages
- write and interpret numbers in scientific notation
- demonstrate number sense through estimation, comparison and scaling
  
- understand and interpret the 5 basic steps in a statistical study
- describe simple random sampling, systematic sampling, convenience sampling and stratified sampling
- distinguish between observational studies and experiments
- describe the placebo effect and the importance of blinding in experiments
- determine a confidence interval from a margin of error
- understand and apply guidelines for evaluating a statistical study
- interpret and create frequency tables, bar graphs, pie charts, histograms and line charts
- interpret graphs that relay statistical information
- distinguish between causation and correlation
- describe possible explanations for correlation
- understand and apply guidelines for recognizing causality
  
- explain the difference between linear and exponential growth
- calculate the doubling-time or half-life in given situations
- contrast exponential growth and logistic growth
- understand factors affecting carrying capacity
- understand and use the Richter scale, decibel scale, and pH scale
  
- understand the concept of a mathematical function
- given a real-life functional situation, identify dependent and independent variables, domain and range
- represent functions with tables, graphs and equations
- use functions given in the form of tables, graphs or equations to answer questions about real-life quantities

Depending on the sections covered by the instructor the students will also be able to:

- distinguish significant digits from non-significant zeros
- identify and distinguish between random and systematic errors
- calculate absolute and relative error
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PLUS at least 2