College Mathematics Course Objectives

Course Goal: Students will be able to apply problem solving techniques to understand and solve general real-world problems as well as problems in the areas of probability, statistics, and finance.

Unit 1: Proportional Reasoning
- Students will be able to apply problem solving techniques such as organized lists, guess-and-check, drawing a picture, and algebraic equations to solve problems.
- Students will be able to set up and solve problems involving ratios and proportions.
- Students will be able to solve problem involving percents and percent change.
- Students will be able to convert units using dimensional analysis within metric and conventional U.S. measurement and well as between metric and conventional U. E. measurements.

Unit 2: Sets
- Determine if a set is well defined.
- Write all the subsets of a given set and label the subsets as proper or improper.
- Given a universal set and some subsets, find a complement, intersection or union.
- Draw a Venn diagram to illustrate two sets.
- Use the cardinal number formula.
- Use Venn diagrams to answer questions about survey results.

Unit 3: Probability
- Use the Fundamental Counting Principle to determine a number of outcomes.
- Calculate a factorial.
- Make a tree diagram to list all outcomes
- Calculate a permutation.
- Calculate a combination.
- Determine whether you should use a combination or permutation to calculate the number of outcomes
- Determine the probability of a given event.
- Determine the odds of a given event.
- Use a Punnet square to determine probability
- Write the sample space of a described probability experiment
- Draw a tree diagram to represent a sample space
- Determine if events are mutually exclusive.
- Use probability rules to determine the probability of an event.
- Use a Venn diagram or table to determine probability of an event.
- Determine the expected value of an event.
- Find the probability of an event.
- Apply rules of conditional probability.
- Draw a tree diagram to determine a conditional probability.
- Find the probability of an event requiring combination or permutations.

Unit 4: Statistics
- Create a frequency distribution for a given set of data.
- Construct a histogram from a frequency distribution.

- Calculate the mean of a set of data.
- Calculate the median of a set of data.
- Calculate the mode of a set of data.
- Solve word problems involving means.
- Calculate the standard deviation of a set of data.
- Determine what percent of a set of data fall within one (two, three) standard deviations of the mean.
- Calculate a z-score
- Use a standard normal distribution z-table to determine the percent (or probability) of data below or above a particular z-score or between two z-scores.
- Use a standard normal distribution z-table to solve problems concerning normally distributed data.

Unit 5: Finance
- Calculate the simple interest on a loan.
- Calculate the future value of a simple interest loan.
- Calculate the present value of a simple interest loan given the future value.
- Calculate the payments for an add-on interest loan.
- Calculate the average daily balance for a billing period.
- Calculate the finance charges for a billing period.
- Calculate a periodic rate.
- Determine the number of compounding periods in a given amount of time.
- Calculate the future value of a compound interest loan.
- Calculate the present value of a compound interest loan given its future value
- Calculate the future value of an ordinary annuity.
- Calculate the amount of interest earned in an ordinary annuity.
- Calculate the total contributions to an ordinary annuity.
- Calculate monthly payments that will produce a given future value.
- Calculate the present value of an annuity.
- Calculate the monthly payment for a simple interest amortized loan.
- Calculate the total interest for a simple interest amortized loans.
- Create an amortization schedule for a simple interest amortized loan.
- Calculate the unpaid balance of an amortized loan.