**Math 105 Learning Objectives**

**Content Objectives**

1. Percentages
   1. Estimate percentages using benchmarks or other appropriate measures
   2. Interpret the meaning of percentages when used as a:
      1. Fraction
      2. Measurement of change (for numbers and percentages)
      3. Comparison

* “of” vs “more than”
  1. Calculate absolute and relative change/difference/error
  2. Use relative change/difference to calculate other values
  3. Identify situations with shifting reference values
  4. Identify “impossible” percentages
  5. Explain problems with averaging percentages

1. Statistical Studies
   1. Identify population, sample, measures of interest (population parameters) for a study
   2. Identify two major types of statistical studies (observational, experimental) and identify which is most appropriate
   3. Identify control and experimental groups
   4. Evaluate a study based on given guidelines
   5. Identify situations with positive, negative and no correlation
   6. Identify causes for correlation
   7. Describe how causation is established and levels of confidence (general)
   8. Identify/explain “misused” statistics from published sources: statistics that are misinterpreted or contradictory, mean vs. median, not statistically significant, unreasonable, etc.
   9. Know different sampling techniques
   10. Identify reasons why a sample is or is not a representative sample
2. Characteristics of Data
   1. For a data set, calculate/identify: mean, median, mode, maximum, minimum, range
   2. Explain meaning of mean and median
   3. Compare effect of outliers on mean and median
   4. Compare changes in mean for different sample sizes
   5. Identify characteristics of data distribution (e.g., skewness)
   6. Read and interpret information from graphs
   7. Use graphs to make inferences about data
   8. Identify characteristics of misleading graphs
3. Inferential Statistics
   1. Explain the relationship between natural variation, a “true population value” and distribution of data and confidence interval
   2. Compare changes in confidence interval for different sample sizes
   3. Characterize a result as significant (or not) based on margin of error and/or confidence interval and explain reasoning
   4. Understand the relationship between expected value and the Law of Large Numbers
4. Financial Literacy
   1. Explain/Identify characteristics of exponential growth
   2. Define characteristics of major types of investments: CDs, savings accounts, real estate, stocks, bonds, mutual funds
   3. Explain importance of term, risk, return, liquidity, diversification in investing
   4. Explain pros/cons of tax-deferred plans and identify major types of tax-deferred/tax-exempt savings plans
   5. Explain major issues in using credit cards: minimum balance, interest rates, fees, etc.
   6. Explain basic characteristics of mortgages: ARM/fixed, down payment, escrow, tax advantages, etc.
   7. Explain meaning of amortization
   8. Using internet calculators or other technology, solve problems based on savings or debt
5. Organize and update a math portfolio.

**Process Objectives**

1. Students will be able to interpret information by eliminating extraneous information, identifying main points in a reading, and determining the numerical reasonableness of their answers.
2. Students will be able to evaluate information and arguments for quality, significance and validity (e.g., identify hidden assumptions, unsupported arguments, and assess conclusions).
3. Students will be able to make judgments and draw appropriate conclusions based on the quantitative analysis of data, while recognizing the limits of this analysis.
4. Students will be able to explain information presented in various mathematical forms (e.g., graphs, diagrams, tables, words)
5. Students will be able to interpret quantitative information from common sources (e.g., newspapers/magazines, TV/radio, advertisements, consumer information, tax information). This quantitative information may take the form of graphs, charts, percentages, or statistics.
6. Students will be able to make and evaluate important assumptions in data collection and/or in statistical studies (e.g, how members of the study were chosen).
7. Students will be able to support an argument using quantitative evidence.