Provides support to ensure success for students co-enrolled in MTH 154 - Quantitative
Reasoning. Course will review foundational topics through direct instruction, guided practice,

o   Evaluate the validity and possible biases in arguments presented in real world

- o Through an examination of examples, develop an ability to study physical systems in the real world by using abstract mathematical equations or computer programs.
- o Collect measurements of physical systems and relate them to the input values for functions or programs.
- o Compare the predictions of a mathematical model with actual measurements obtained.
- o Quantitatively compare linear and exponential growth.
- o Explore behind the scenes of familiar models encountered in daily life (such as weather models, simple physical models, population models, etc.).
- • Mathematical Modeling and Analysis
  - o Collect measurements and data gathered (possibly through surveys, internet, etc.) into tables, displays, charts, and simple graphs.
  - o Create graphs and charts that are well labeled and convey the appropriate information based upon chart type.
  - o Explore interpolation and extrapolation of linear and non-linear data. Determine the appropriateness of interpolation and/or extrapolation.
  - o Identify and distinguish linear and non-linear data sets arrayed in graphs, identifying when a linear or non-linear model or trend is reasonable for given data or context.
  - o Correctly associate a linear equation in two variables with its graph on a numerically accurate set of axes.
  - o Numerically distinguish which one of a set of linear equations is modeled by a given set of (x,y) data points.
  - o Identify a mathematical model's boundary values and limitations (and related values and regions where the model is undefined). Identify this as the domain of an algebraic model.
  - o Using measurements (or other data) gathered and a computer program (spreadsheet or GDC) to create different regressions (linear and non-linear), determine the best model, and use the model to estimate future values.
- • Application
  - o Starting with a verbally described requirement, generate an appropriate mathematical approach to creating a useful mathematical model for analysis.
  - o Explore the graphical solutions to systems of simultaneous linear equations, and their real world applications.
  - o Numerically analyze and mathematically critique the utility of specific mathematical models: instructor-provided, classmate generated, and self-generated.

Validity Studies
- • Identify logical fallacies in popular culture: political speeches, advertisements, and other attempts to persuade.
- • Analyze arguments or statements from all forms of media to identify misleading information, biases, and statements of fact.
- • Develop and apply a variety of strategies for verifying numerical and statistical information found through web searches.
- • Apply the use of basic symbolic logic, truth values, and set theories to justify decisions made in real-life applications, such as if-then-else statements in spreadsheets, Venn Diagrams to organize options, truth values as related to spreadsheet and flow-chart output. (Students must have experience with both symbolic logic and basic truth tables to meet this standard.)

Major Topics to   Be Included:

Topics focus on student needs and may include:
    a. Arithmetic and order of operations
    b. Operations with fractions, percentages, and decimals
    c. Exponents
    d. Formulas
    e. Units and measurement
    f. Simplifying algebraic expressions and solving linear equations
    g. Using technology including calculators and spreadsheet software

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