MATH 110 Mathematical Reasoning

Course objectives:
Upon completing the course, students should be able to:

- Carry out the steps of a mathematical modeling process.
- Apply a variety of mathematical models to problem situations.
- Analyze data using descriptive statistics.
- Calculate and interpret discrete probabilities.
- Present a written or oral report outlining a problem situation, a proposed mathematical model, and a solution, together with a discussion of both the assumptions upon which the model is based and the limitations of the model.
- Analyze data using a spreadsheet program.
- Use a spreadsheet program to produce tables and graphs, and include them in a written report.

Usual course content:
1. Mathematical modeling.
   The use of modeling as an approach to problem-solving; making of assumptions, choosing of variables, limitations of any mathematical model, and writing a reasonable answer to a problem, in sentence form.
2. Basic mathematical reasoning and skills.
   This includes topics such as estimation, percentages, correlation versus causation, using and interpreting graphs and applications of length, area and volume.
3. Linear and nonlinear models.
   Direct proportion models, linear models, compound interest, population growth.
4. Basic probability and statistics.
   Elementary discrete probability, descriptive statistics, the normal distribution, confidence intervals.
5. Introduction to using a spreadsheet program.

Technology:
Students will be using calculators and a spreadsheet program.

Students who may benefit:
All students who are not elementary education majors and feel they would enjoy a review of basic mathematics skills using interesting applications. This course satisfies the quantitative reasoning requirement in the general education program at EMU. The requirement can also be satisfied by courses such as MATH 120 - Calculus I, or MATH 118 - Linear Models and Probability, provided the student falls in the QR Choice category. Students who major in elementary education have to take MATH 110E - Mathematical Reasoning: Applications for Elementary School Teachers. For more information about the Quantitative Reasoning requirement, please consult the catalog.