Prerequisite: Completion of MDE 10 followed by co-enrollment in MDE 54 with MTH 154 or placement in MTH 154 or placement in co-requisites MTH 154 and MDE 54.

Communication

Presents topics in proportional reasoning, modeling, financial literacy and validity studies (logic and set theory). Major emphasis is on the process of taking a real-world situation, identifying the mathematical foundation needed to address the problem, solving the problem and applying what is learned to the original situation. This is a Passport and UCGS transfer course. Prerequisite: Completion of MDE 10 followed by co-enrollment in MDE 54 with MTH 154 or placement in MTH 154 or placement in co-requisites MTH 154 and MDE 54. Lecture 3 hours. Total 3 hours per week. 3 credits

The Quantitative Reasoning course is organized around big mathematical concepts. The course's nontraditional treatment of content will help students develop conceptual understanding by supporting them in making connections between concepts and applying previously learned material to new contexts. The course will help to prepare students for success in future courses, gain skills for the workplace, and participate as productive citizens in our society.

Upon completing the course, the student will be able to:

Interpret and communicate quantitative information and mathematical and statistical concepts using language appropriate to the context and intended audience.

- Apply strategies for solving open-ended questions requiring analysis and synthesis of multiple calculations, data summaries, and/or models.
- Apply problem solving strategies to applications requiring multiple levels of engagement.

Reasoning

Reason, model, and draw conclusions or make decisions with quantitative information.

- Draw conclusions or make decisions in quantitatively based situations that are dependent upon multiple factors. Students will analyze how different situations would affect the decisions.
- Present written or verbal justifications of decisions that include appropriate discussion of the mathematics involved.
- Recognize when additional information is needed.
- Recognize the appropriate ways to simplify a problem or its assumptions.

Evaluation

Critique and evaluate quantitative arguments that utilize mathematical, statistical, and quantitative information.

 Evaluate the validity and possible biases in arguments presented in real world contexts based on multiple sources of quantitative information – for example; advertising, internet postings, consumer information, political arguments.

Technology

Use appropriate technology in a given context.

- Use a spreadsheet to organize quantitative information and make repeated calculations using simple formulas.
- Search for and apply internet-based tools appropriate to a given context for example, an online tool to calculate credit card interest (m)-6(8(r)-5 (e t5 (t)-9)T0 Tc 0 Tw 31.97m(

Solve real-life problems that include interpretation and comparison of summaries which extend beyond simple measures, such as weighted averages, indices, or ranking and evaluate claims based on them.

Solve real-life problems requiring interpretation and comparison of various representations of ratios (i.e., fractions, decimals, rates, and percentages including part to part and part to whole, per capita data, growth and decay via absolute and relative change).

Distinguish between proportional and non-proportional situations and, when appropriate, apply proportional reasoning leading to symbolic representation of the relationship. Recogn.141 TD(n.141 TD(n.141

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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.]

- Financial Literacy (Interest, Borrowing, and Investing)
- Perspective (Complex Numeric Summaries, Ratios, Proportions, Conversions, Scaling, Scientific Notation)
- Modeling (Observation, Mathematical Modeling and Analysis, Application)
- Validity Studies (Statements, Conclusions, Validity, Bias, Logic, Set Theory)