

Advanced Mathematical Decision Making

Course Syllabus

Course Title: Advanced Mathematical Decision Making (AMDM)

Department: Mathematics/Business Collaborative

Primary Course Materials: Textbook: AMDM Workbooks (Supplied by CHS)

Prerequisite Course(s): Transitions From Algebra to Geometry or higher

Course Description: This course is designed for students to continue their algebra and geometry foundations. All students will be actively engaged in problem solving and reasoning, while connecting mathematical concepts and communicating with the proper mathematical vocabulary. Emphasis will be placed on investigating and solving real-world problems that will include traditional mathematical problems, as well as open-ended and open-response questions. Students will be required to keep an organized notebook, to read and interpret the text and to perform both collaborative and independent research.

Essential Questions:

1. How can we use algebra and geometry fundamentals to explore and critically analyze real world situations and models?
2. How is algebra and geometry used to analyze and model real world applications in a variety of disciplines, such as science, business, technology and geography?
3. How can we use mathematical processes and reasoning to solve everyday problems?

Content Outline:

Below is the AMDM board's complete course outline. It is our goal to select applicable and logical work from the complete outline that will satisfy one semester worth of class time (63 classes).

Unit 1: Analyzing Numerical Data 20 Days

- Estimating Large Numbers (5 Days)
- Using Ratios (6 Days)
- Indices Using Weighted Sums and Averages (5 Days)
- Validating Identification Numbers (4 Days)

Unit 2: Probability 24 Days

- Determining Probabilities (9 Days)
- Everyday Decisions Based on Probabilities (8 Days)
- Expected Value (7 Days)

Unit 3: Statistical Studies 29 Days

- Statistical Investigations (10 Days)
- Analyzing Data (13 Days)
- Sources of Variability (6 Days)

Unit 4: Using Recursion in Models and Decision Making 16 Days

- Relationships in Data (5 Days)
- Recursion in Exponential Growth and Decay (5 Days)
- Recursion Using Rate of Change (8 Days)

- Recursion in Cyclical Models (3 Days)

Unit 5: Using Functions in Models and Decision Making **20 Days**

- Regression in Linear and Nonlinear Functions (4 Days)
- Cyclical Functions (7 Days)
- Step and Piecewise Functions (9 Days)

Unit 6: Decision Making in Finance **28 Days**

- Future Value of an Investment (8 Days)
- Present Value of an Investment (7 Days)
- Building an Investment (6 Days)
- Using Credit (7 Days)

Unit 7: Networks and Graphs **22 Days**

- Circuits, Paths and Graph Structures (9 Days)
- Spanning Trees (4 Days)
- Graph Coloring (4 Days)
- Program Evaluation and Review Technique (PERT) Charts (5 Days)