Mathematical Models with Applications

Course Overview and Syllabus

Course Number: MA4072

Grade level: 10-12

Prerequisite Courses: Algebra I

Credits: 1.0

Course Description

Broadening and extending the mathematical knowledge and skills acquired in Algebra I, the primary purpose of this course is to use mathematics as a tool to model real-world phenomena students may encounter daily, such as finance and exponential models. Engaging lessons cover financial topics, including growth, smart money, saving, and installment loan models. Providing timely and highly useful content, this two-semester course is a must-have for any high school student. Prior mathematical knowledge is expanded and new knowledge and techniques are developed through real-world application of useful mathematical concepts.

Course Objectives

Throughout the course, you will meet the following goals:

- Model real world situations using the various forms of linear and quadratic functions
- Graph trigonometric functions and identify their properties
- Use exponential functions to model and solve mathematical and real-world problems such as population growth and compound interest
- Understand the fundamentals of personal finance and financial planning
- Apply counting methods to calculate binomial probabilities
- Interpret and represent data in various formats, and use it to model and make predictions
- Translate between the properties of geometric shapes in the plane to three-dimensional figures

Student Expectations

This course requires the same level of commitment from you as a traditional classroom course would. Throughout the course, you are expected to spend approximately 5–7 hours per week online on the following activities:

- Interactive lessons that include a mixture of instructional videos and tasks
- Assignments in which you apply and extend learning in each lesson
- Assessments, including quizzes, tests, and cumulative exams

Communication

Your teacher will communicate with you regularly through discussions, email, chat, and system announcements. You will also communicate with classmates, either via online tools or face to face, as you collaborate on project, ask and answer questions in your peer group, and develop speaking and listening skills.

Grading Policy

You will be graded on the work you do online and the work you submit electronically to your teacher. The weighting for each category of graded activity is listed below.

Grading Category	Weight
Assignments	10%
Labs	10%
Lesson Quizzes	20%
Unit Tests	40%
Cumulative Exams	20%
Additional	0%

Scope and Sequence

When you log into the Virtual Classroom, you can view the entire course map, which provides a scope and sequence of all topics you will study. Clicking a lesson's link in the course map leads to a page listing instructional activities, assignments, and learning objectives specific to that lesson. The units of study are summarized below:

Unit 1: Problem-Solving Models

Unit 2: Graphical and Statistical Models

Unit 3: Function Models

Unit 4: Financial Models

Unit 5: Exponential, Trigonometric, and Variation Models

Unit 6: Geometric Models