In this course, students will study the broad characteristics of functions and their behaviors and solve problems that require the formulation of linear, quadratic, polynomial, exponential, logarithmic equations or a system of equations or inequalities. Probability, experimental design and implementation, and analysis of data will be incorporated into the study of functions, and data will be generated by practical applications derived from real life scenarios.

This course is built to Virginia's standards for Algebra, Functions and Data Analysis.

Length: Two Semesters

Unit 1: Functions and Relations

- What Is a Function?
- Linear Functions
- Linear Equations and Inequalities
- Linear Systems
- Graphs of Functions
- Finding Domain and Range from a Graph
- Functions and Relations Wrap-Up

Unit 2: Exponents and Exponential Functions

- Exponential Functions
- Graphs of Exponential Functions
- Exponential and Linear Growth
- Exponents and Exponential Functions Wrap-Up

Unit 3: Quadratic Equations and Functions

- Solving Quadratic Equations
- Graphs of Quadratic Functions
- Linear, Quadratic, and Exponential Functions
- Quadratic Equations and Functions Wrap-Up

Unit 4: Transformation of Functions

- Parent Functions
- Shifting Functions
- Stretching and Compressing Functions
- Transformations of Parent Functions
- Comparing and Analyzing Function Types
- Wrap-up: Transformations of Functions

Unit 5: Modeling Data

- Scatterplots
- Linear Models in Data
- Regression Methods
- Nonlinear Models

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- Modeling Data Wrap-Up

Unit 6: Semester Wrap-Up

- Semester Wrap-Up

Unit 7: Introduction to Statistics

- Collecting Data
- Random Sampling
- Experimental Design
- Evaluating Statistical Studies
- Introduction to Statistics Wrap-Up

Unit 8: Describing Data

- Categorical Data
- Numerical Data
- Two-Way Frequency Tables
- Box Plots
- Investigate a Statistical Question
- Describing Data Wrap-Up

Unit 9: Introduction to Probability

- Random Outcomes, Sample Spaces, and Events
- Probabilities of Repeated Experiments
- Permutations and Combinations
- Independent and Dependent Events
- Conditional Probability
- Introduction to Probability Wrap-Up

Unit 10: Applications of Probability

- Using Two-Way Frequency Tables
- Using Probability to Make Decisions
- Simulations
- Designing a Game of Chance
- Applications of Probability Wrap-Up

Unit 11: Probability Distributions

- Normal Distributions
- z-Scores
- Probability Distributions Wrap-Up

Unit 12: Semester Wrap-Up

- Semester Wrap-Up

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