

The course syllabus for

Advanced Mathematics

Instructor: Mrs. Linda Koontz

Course Description

Advanced Mathematics is a one semester course which prepares the student for college level mathematics. This course will extend the student's understanding of algebraic concepts including relations, functions, and graphing learned in Algebra 2 through Linear and Polynomial functions to advanced functions and graphing including Conics, Exponential and Logarithmic functions. Additionally, this course will extend the student's understanding and computational skills of Trigonometric functions to include graphing and Trigonometric equations and identities. Discrete mathematics including Statistics and Probability will be learned as well as an introduction to the basics of Calculus.

Enduring Understandings

The student will understand:

- Situations can be described with linear and nonlinear equations.
- Algebraic problems can be solved with the assistance of technology
- Equations can be represented as graphs that help to predict data.
- There are many useful tools for graphing nonlinear functions.
- Many real-world situations can be solved using a system of equations
- Sometimes matrices are useful for solving systems of equations.
- Diagrams and graphs are critical tools in describing and quantifying many real-world problems and situations.
- There are basic relationships in Trigonometry that in a more complex and comprehensive study have applications in construction, geography, physics, acoustics, medicine, meteorology, and navigation, among other fields.
- Many natural phenomena increase or decrease in intensity exponentially and therefore can be expressed as an exponential equation. To solve them it is sometimes necessary to use their inverse, the logarithm. Applications include population increases, sound intensities, financial investments, depreciation, and many others.
- Develop and evaluate inferences and predictions based on sequential data.
- Understand and apply basic ideas of chance and probability.
- Apply a variety of techniques, tools, and formulas for data analysis.
- Introduction to the fundamentals of Calculus.

Content Topics

Unit 1

Relations, Functions, and Graphs

Unit 2
Trigonometry

Unit 3
Advanced Functions and Graphing

Unit 4
Discrete Mathematics

Unit 5
Calculus

Calculator Skills

Expected prior to Pre-Calculus

- Function Graphing
- Zooming and manually setting windows
- Function values: single values and table
- Tracing graphs
- Finding zeros and intersections
- Entering lists and making scatterplots
- Graphing best fit lines
- Fixing common errors
- Matrix entry and basic operations

Taught in Advanced Mathematics

- Function graphing and maxima and minima of functions
- Regression using various function types
- Combinatorial and statistical features

Required Materials

- TI-83 (Plus) or TI-84 (Plus)
- Spiral notebook for notes only
- Three ring binder with notebook paper for homework assignments, and returned quizzes and tests.
- Pencils and a pen for corrections.
- Textbook: Advanced Mathematical Concepts, Glencoe/McGraw-Hill.

Assessments

Grades will be based on homework assignments, notebooks, quizzes, chapter tests, unit exams, and a final exam.

Attendance Policy:

Your attendance and participation in each unit and lesson of this course is crucial.

Blackboard Information:

You will be using a Course Management System called Blackboard, which will allow you to access information on a 24 / 7 basis. Access the Blackboard course by going to this website:

<https://blendedschools.blackboard.com>

1. Enter your assigned user name. If you do not know your username, contact your school district or email help@blendedschools.net
2. Enter your assigned password. If you do not know your password, contact your school district.
3. Click on the link to “Algebra IIA” under the purple Courses tab.

Your first task:

1. Read through this syllabus carefully!
2. Go to the Blackboard site and log in to our course. Navigate around the course to become familiar with it.
3. Email you instructor with any questions you might have!