

# AP Precalculus

**Instructor: April D. Sims**

**Email: [simsa@etsu.edu](mailto:simsa@etsu.edu)**

**Phone: 439-4271**

## Course Description

AP Precalculus centers on functions modeling dynamic phenomena. This research-based exploration of functions is designed to better prepare students for college-level calculus and provide grounding for other mathematics and science courses. In this course, students study a broad spectrum of function types that are foundational for careers in mathematics, physics, biology, health science, business, social science, and data science. Furthermore, as AP Precalculus may be the last mathematics course of a student's secondary education, the course is structured to provide a coherent capstone experience rather than exclusively focusing on preparation for future courses.

Throughout this course, students develop and hone symbolic manipulation skills, including solving equations and manipulating expressions, for the many function types throughout the course. Students also learn that functions and their compositions, inverses, and transformations are understood through graphical, numerical, analytical, and verbal representations, which reveal different attributes of the functions and are useful for solving problems in mathematical and applied contexts. In turn, the skills learned in this course are widely applicable to situations that involve quantitative reasoning.

## Advanced Placement Precalculus Course Description

<https://apstudents.collegeboard.org/courses/ap-precalculus>

## Units of Study

### Unit 1 Polynomial and Rational Functions

- Change in Tandem
- Rates of Change
- Rates of Change in Linear and Quadratic Functions
- Polynomial Functions and Rates of Change
- Polynomial Functions and Complex Zeros
- Polynomial Functions and End Behavior
- Rational Functions and End Behavior
- Rational Functions and Zeros
- Rational Functions and Vertical Asymptotes
- Rational Functions and Holes
- Equivalent Representations of Polynomial and Rational Expressions
- Transformations of Functions
- Function Model Selection and Assumption Articulation
- Function Model Construction and Application

## Unit 2 Exponential and Logarithmic Functions

- 2.1 Change in Arithmetic and Geometric Sequences
- 2.2 Change in Linear and Exponential Functions
- 2.3 Exponential Functions
- 2.4 Exponential Function Manipulation
- 2.5 Exponential Function Context and Data Modeling
- 2.6 Competing Function Model Validation
- 2.7 Composition of Functions
- 2.8 Inverse Functions
- 2.9 Logarithmic Expressions
- 2.10 Inverses of Exponential Functions
- 2.11 Logarithmic Functions
- 2.12 Logarithmic Function Manipulation
- 2.13 Exponential and Logarithmic Equations and Inequalities
- 2.14 Logarithmic Function Context and Data Modeling
- 2.15 Semi-Log Plots

## Unit 3 Trigonometric and Polar Functions

- 3.1 Periodic Phenomena
- 3.2 Sine, Cosine, and Tangent
- 3.3 Sine and Cosine Function Values
- 3.4 Sine and Cosine Function Graphs
- 3.5 Sinusoidal Functions
- 3.6 Sinusoidal Function Transformations
- 3.7 Sinusoidal Function Context and Data Modeling
- 3.8 The Tangent Function
- 3.9 Inverse Trigonometric Functions
- 3.10 Trigonometric Equations and Inequalities
- 3.11 The Secant, Cosecant, and Cotangent Functions
- 3.12 Equivalent Representations of Trigonometric Functions
- 3.13 Trigonometry and Polar Coordinates
- 3.14 Polar Function Graphs
- 3.15 Rates of Change in Polar Functions

## Course Textbook

Demana, Franklin D., Bert K. Waits, et al. *Precalculus: Graphical, Numerical, Algebraic*. 10th Edition. Pearson.

## Course Materials/Supply List

- Notebook paper
- Graph paper
- Pencils
- TI-83 or TI-84 Graphing Calculator – I am most familiar and am best able to help students with this type of calculator. If students choose to use another calculator, it must be approved for use on the Tennessee End of Course Exam and the ACT. Students who purchase other calculators are responsible for learning how to use the calculators on their own.
- Optional but appreciated: 1 box of tissues; Expo dry erase markers

## Classroom Expectations

- Disruptions and excessive talking will not be tolerated. Making a high grade in this class and a high score on the AP Exam will require focus, determination, and hard work. Your behavior must reflect this.
- **Cell Phones:** Silenced and placed in assigned pocket at the beginning of each class.

## Canvas Expectations

All assignments for each week will be posted in Canvas and will be available each Monday. Students are expected to check Canvas each week/day to make themselves aware of daily assignments and upcoming quizzes and tests.

## AP Course and Exam Info

Besides learning the material, we will be practicing for the AP Exam, which will be in May. The AP Exam is scored from 1-5 and may earn a Calculus I college credit for the student, depending on the required score for each individual college (3 is commonly accepted). College Board exam information and resources:

<https://apstudents.collegeboard.org/courses/ap-precalculus/assessment>

## Grading

Grades are calculated by dividing points earned by points assigned. Homework will be assigned and discussed in class, but not graded. Grades will consist of Quizzes (approx. 30 points each), AP Practice Problems (approx. 30 points each), and Tests (100 points each).

**Check PowerSchool regularly for current grades.**

## University School Grading Scale

Total Points	Grade
100 – 90	A
89 - 80	B
79 - 70	C
69 - 60	D
59 - Below	F

## Missing/Late Work Policy

This is a university-level course. You are expected to keep up with and be responsible for all missed work. For missed work due to absences, University School policy is one extra day per missed day plus one more day.

## Extra Help

Students may come to my room from 12:00 – 12:30 for extra help. If this is during their lunchtime, they are allowed to switch their lunch to 12:30 – 1:00.

## Academic Integrity

### Plagiarism/Cheating

University School is responsible for maintaining academic integrity for all of its students. It is the responsibility of the students to refrain from infractions of academic integrity, from conduct that may lead to suspicion of such infractions, and from conduct that aids others in such infractions. Infractions of academic integrity include but are not limited to:

- Cheating (using or attempting to use any information that the student knows is unauthorized)
- Fabrication (unauthorized falsification or invention of information in an academic assignment)
- Plagiarism (representing the words or ideas of another as one's own ideas, including copying from another person's paper and using Artificial Intelligence sites (AI) without proper citations)
- Facilitating infractions of academic integrity (Helping or attempting to help another commit an infraction of academic integrity)

The above policy includes copying homework, lab papers, workbooks, and tests materials. It also includes using the on-line translators in world languages. Students who facilitate cheating will receive the same consequences as those who copy the work.

**Students caught plagiarizing/cheating will be addressed by teacher and/or school administration. Incidents of cheating or plagiarism could result in a disciplinary referral and loss of credit for the given assignment.** Repeat offenses may result in additional disciplinary action at the discretion of the administration.