Ms. Bosquez
Norco High School
AP Pre-Calculus
Course Syllabus 2023-2024

OVERVIEW:

AP Precalculus is designed for the college-bound student that plans to major in either a STEM or non-STEM field. In AP Precalculus, students explore everyday situations and phenomena using mathematical tools and lenses. Through regular practice and precision, students build deep mastery of modeling and functions, and they examine scenarios through multiple representations. They will learn how to observe, explore, and build mathematical meaning from dynamic systems, an important practice for thriving in an ever-changing world.

AP Precalculus prepares students for other college-level mathematics and science courses. The framework delineates content and skills common to college precalculus courses that are foundational for careers in mathematics, physics, biology, health science, social science, and data science. Students study each function type through their graphical, numerical, verbal, and analytical representations and their applications in a variety of contexts. Furthermore, students apply their understanding of functions by constructing and validating appropriate function models for scenarios, sets of conditions, and data sets, thereby gaining a deeper understanding of the nature and behavior of each function type. Advanced Placement Precalculus covers a variety of advanced topics including a review of algebra, functions and graphs, intercepts, zeros and solutions, polynomial and rational functions, exponential and logarithmic functions, the unit circle, graphs of trigonometric functions, applications of trigonometry, verifying identities, solving trigonometric equations, linear models and systems of equations, matrices and determinants, conics, parametric equations, polar coordinates, and vectors.

Modeling is also a key feature of the course. Students select, construct, and validate function models using transformations of functions and regressions. Students learn to select mathematical models-based characteristics of a bivariate data set; characteristics of covarying quantities and their relative rates of change; or a set of characteristics such as zeros, asymptotes, and extrema. Students also identify, interpret, and apply information from a function model for a given context or data set, subject to assumptions and limitations related to the context.

Through the course, students strengthen their procedural and symbolic fluency skills needed for higher level mathematics and routinely use all the standards for mathematical practice (SMPs). Graphing calculators and their applications will be emphasized. While studying each function type, students solve equations and construct equivalent analytic representations in both contextual and purely mathematical settings.

Graphing Calculator:

Since many problems rely heavily on the use of a graphing calculator and the AP exam has a graphing calculator portion, I frequently use a graphing calculator in class for example. I use a TI 84, but students sometimes prefer to use a TI-83. Since the AP test is half calculator, I find it very important to give the students as much practice as possible in getting to know their calculator. While going over how to use a calculator to solve a problem, I also discuss with the students how to do the problem without a calculator for the non-calculator part of the test.

First Semester	Second Semester
Unit 1A: Polynomial Functions • 1.1 Change in Tandem • 1.2 Rates of Change • 1.3 Rates of Change in Linear and Quadratic Functions • 1.4 Polynomial Functions and Rates of Change • 1.5 Polynomial Functions and Complex Zeros • 1.6 Polynomial Functions and End Behavior Unit 1B: Rational Functions • 1.7 Rational Functions and End Behavior • 1.8 Rational Functions and Zeros • 1.9 Rational Functions and Vertical Asymptotes • 1.10 Rational Functions and Holes • 1.11 Equivalent Representations of Polynomial and Rational Expressions • 1.12 Transformations of Functions • 1.13 Function Model Selection and Assumption Articulation • 1.14 Function Model Construction and Application Unit 2A: Exponential and Inverse 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	Unit 3A: 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 Unit 3B: Trigonometric and Polar Functions • 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

Unit 2B: Logarithmic 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	**Post - AP Exam - if time permits** Unit 4A: Functions involving Parameters, Vectors and Matrices • 4. 1 Parametric Functions • 4. 2 Parametric Functions Modeling Planar Motion • 4. 3 Parametric Functions and Rates of Change • 4. 4 Parametrically Defined Circles and Lines • 4. 5 Implicitly Defined Functions • 4. 6 Conic Sections • 4. 7 Parametrization of Implicitly Defined Functions Unit 4B: Functions involving Parameters, Vectors and Matrices • 4. 8 Vectors • 4. 9 Vector-Valued Functions • 4. 10 Matrices • 4. 11 The Inverse and Determinant of a Matrix • 4. 12 Linear Transformations and Matrices • 4. 13 Matrices as Functions • 4. 14 Matrices Modeling Contexts

AP Exam: **Monday, May 13, 2024**

Students will be evaluated using a variety of methods including but not limited to homework, classwork, unit quizzes and tests. Students may also take and be evaluated on the College Board AP exam.

Section	Question Type	Number of Questions	Exam Weighting	Timing
1	**Multiple Choice**			
	Part A: Graphing Calculator not Permitted	28	43.75%	80 minutes
	Part B: Graphing Calculator required	12	18.75%	40 minutes
2	**Free Response**			

	Part A: Graphing Calculator required	2	18.75%	30 minutes
	Part B: Graphing Calculator not permitted	2	18.75%	30 minutes

Grading Policy:

The following types of assessment will be utilized and weighted in the following manner.

- Tests   50%
- Quizzes   30%
- Assignments   20%

Grading Scale:

Grades will be assigned based on the following scale:

A 90 -100%   D 60 – 69%

B 80- 89%   F Less than 60%

C 70 – 79%

Classroom Guidelines:

- Be in a seat <u>ready to work</u> when tardy bell rings.
- Students are expected to be on task and focused on mathematics during class.
- Students are expected to be respectful and thoughtful about other students, teacher, and mathematics while in class.
- Students are expected to think about, make sense, argue, think and persevere in solving mathematical problems while in class and while doing their projects and homework outside of class.
- Students are expected to ask for help and be persistent in finding that help.
- I will be following the Norco High School Attendance & Tardy Policy (in NHS Student-Parent Handbook).
- I will be following the Cell Phone Policy (in NHS Student-Parent Handbook).

Behavior: behavior leads to a safe and supportive environment with a sense of community and belonging. The product of these behaviors is a positive learning environment and competent responsible citizens. Measurable results include fewer discipline issues, better attendance, higher academic performance, and a generally more positive, inclusive, and encouraging atmosphere.

Note to Parents/Guardians:

If you have any questions, please feel free to call me at 951-736-3241. If you leave a message, please leave your student's name, brief description of your concerns and a number where you can be reached during the day. I will return calls during my conference period, before or after school. Emails are the preferred method of communication as I have greater opportunity to answer emails. You may reach me by e-mail: abosquez@cnusd.k12.ca.us

Parent/Guardian & Student Signature Page

I have read the AP Pre-Calculus Course Syllabus and I understand the course requirements as well as the Classroom Guidelines.

_____   _____
Student name (print)   Student signature

_____   _____
Parent/Guardian name (print)   Parent/guardian signature

Please provide contact information:

(   )_____

Email: _____

<u>If there is any other information that you or your student feel that I need to know in order to assist in making the year a successful and positive one, please provide it below.</u>