AP Calculus Syllabus

Course Prerequisites

You should have successfully completed courses in which you studied algebra, geometry, trigonometry, analytic geometry, and elementary functions. You should understand the properties of linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise-defined functions and know how to graph these functions and solve equations involving them. You should also be familiar with algebraic transformations, combinations, compositions, and inverses for general functions.

Course Description

Explore the concepts, methods, and applications of differential and integral calculus. You'll work to understand the theoretical basis and solve problems by applying your knowledge and skills.

Skills You'll Learn

- Determining expressions and values using mathematical procedures and rules
- Connecting representations
- Justifying reasoning and solutions
- Using correct notation, language and mathematical conventions to communicate results or solutions

Equivalency and Prerequisites

College Course Equivalent - **A first-semester college calculus course devoted to topics in differential and integral calculus.**
Algebra I & II, Geometry, PreCalculus

Exam Dates

AP Calculus AB Exam; Monday, May 13, 2024; 8 am. This is the regularly scheduled date for the AP Calculus AB Exam.
Add this date to your calendar.

AP Calculus Units

Unit 1: Limits and Continuity – You will start to explore how limits will allow you to solve problems involving change and to better understand mathematical reasoning about functions. Topics may include:

- How limits help us to handle change at an instant
- Definition and properties of limits in various representations
- Definitions of continuity of a function at a point and over a domain
- Asymptotes and limits at infinity
- Reasoning using the Squeeze theorem and the Intermediate Value Theorem

On The Exam: **10%–12% of exam score**

Unit 2: Differentiation: Definition and Fundamental Properties – You will apply limits to define the derivative, become skillful at determining derivatives, and continue to develop mathematical reasoning skills. Topics may include:

- Defining the derivative of a function at a point and as a function
- Connecting differentiability and continuity
- Determining derivatives for elementary functions
- Applying differentiation rules

On The Exam: **10%–12% of exam score**

Unit 3: Differentiation: Composite, Implicit, and Inverse Functions – You will master using the chain rule, develop new differentiation techniques, and be introduced to higher-order derivatives. Topics may include:

- The chain rule for differentiating composite functions
- Implicit differentiation
- Differentiation of general and particular inverse functions
- Determining higher-order derivatives of functions

On The Exam: **9%–13% of exam score**

Unit 4: Contextual Applications of Differentiation – You will apply derivatives to set up and solve real-world problems involving instantaneous rates of change and use mathematical reasoning to determine limits of certain indeterminate forms. Topics may include:

- Identifying relevant mathematical information in verbal representations of real-world problems involving rates of change
- Applying understandings of differentiation to problems involving motion
- Generalizing understandings of motion problems to other situations involving rates of change
- Solving related rates problems

- Local linearity and approximation
- L'Hospital's rule

On The Exam: **10%–15% of exam score**

Unit 5: Analytical Applications of Differentiation - After exploring relationships among the graphs of a function and its derivatives, you'll learn to apply calculus to solve optimization problems. Topics may include:

- Mean Value Theorem and Extreme Value Theorem
- Derivatives and properties of functions
- How to use the first derivative test, second derivative test, and candidates test
- Sketching graphs of functions and their derivatives
- How to solve optimization problems
- Behaviors of Implicit relations

On The Exam: **15%–18% of exam score**

Unit 6: Integration and Accumulation of Change – **You will learn to apply limits to define definite integrals and how the Fundamental Theorem connects integration and differentiation. You will apply properties of integrals and practice useful integration techniques. Topics may include:**

- Using definite integrals to determine accumulated change over an interval
- Approximating integrals using Riemann Sums
- Accumulation functions, the Fundamental Theorem of Calculus, and definite integrals
- Antiderivatives and indefinite integrals
- Properties of integrals and integration techniques

On The Exam: **17%–20% of exam score**

Unit 7: Differential Equations – **You will learn how to solve certain differential equations and apply that knowledge to deepen your understanding of exponential growth and decay. Topics may include:**

- Interpreting verbal descriptions of change as separable differential equations
- Sketching slope fields and families of solution curves
- Solving separable differential equations to find general and particular solutions
- Deriving and applying a model for exponential growth and decay

On The Exam: **6%–12% of exam score**

Unit 8: Applications of Integration – **You will make mathematical connections that will allow you to solve a wide range of problems involving net change over an interval of time and to find areas of regions or volumes of solids defined using functions. Topics may include:**

- Determining the average value of a function using definite integrals
- Modeling particle motion
- Solving accumulation problems
- Finding the area between curves
- Determining volume with cross-sections, the disc method, and the washer method

On The Exam: **10%–15% of exam score**

Interactivity

You will have the opportunity to collaborate with other students and your teacher using online resources and online discussion boards. These tools allow you to build community in the online classroom and share learning and experiences that enable all students to be productive 21st century learners. You may also have opportunities to meet face-to-face for collaboration, group work, and personalized instruction.

Grading Guidelines

Grading procedures follow the district guidelines, which require at least 3 major grades (50%) and at least 6 daily grades (50%) each 9-week grading cycle (minimum of 9 grades). Daily assignments and due dates are posted in Schoology. **Submit all assignments in Schoology**. Daily grades include quizzes, classwork, and homework. Major grades include unit tests as well as projects and other assessments. Check Skyward for grades. The weekly newsletter provides weekly reminders to students and parents to check your progress on an on-going basis.

The final semester average is based upon FBISD grading guidelines and will consist of the 1st and 2nd Nine Weeks grade (44.5% each) and the semester exam grade (15%). By Fort Bend ISD grading guidelines, have a course grade of at least 70% to pass the course. This process is repeated for the second semester.

Required Resources

You will need to download the following applications . . . Desmos, TI-nSpire CX Calculator Software (link is in Schoology) and Remind 101. Anything else will be given as needed. Also, online signup for AP Classroom is an absolute must. This I will handle during class.

Technical Requirements

- Technical System Requirements: PC or MAC preferred
- Minimum Bandwidth Required: 128K
- Video Player: Quicktime; VLC Player; Windows Media Player
- Plug-ins: Java 10 or higher; Adobe Reader 6 or higher
- Student must be able to download files: Yes
- Software needed to complete this course: Schoology
- Pop-Up blocker: Off
- Caching: Off
- Browser compatibility: Mozilla Firefox 7 or higher preferred; Google Chrome 11 or higher; Internet Explorer 8 or higher.

Goal/Goal Setting:

Studies show successful people, possess similar character traits: set goals (revise and adjust), self-motivated, hardworking, self-aware, persevere, responsible, accountable, and honest. My goal is to collaborate with you to deliver curriculum and support, blended learning, academic rigor, college readiness prep, and quality-learning experiences. To achieve this, a partnership agreement between us is essential. Taking ownership of your learning will allow you to navigate your unique math pathway. By identifying these self-assessment questions, you will narrow your targets to meet your goals: 1) what do you know, 2) what you need to learn, and 3) what evidence will you use to show what you know. We will use FBISD Learning Progressions where students will self-assess their knowledge and understanding throughout the unit of study. Each day you will review the Learning Progression, identify where you are and set a goal. Resources such as videos, notes, graphic organizers, and other explorations are in Schoology to support your learning goals. It is vital that you communicate with your teacher and your parent/guardian, as we are an added support to help you meet your goals.

Online Textbook & Other Online Resources:

The Calculus textbook is available online. It is not available through the Schoology page. Students will find the online resources extremely useful for their success in this class. We will use a variety of online resources such as **WebAssign, Desmos, Flipgrid, Office 365, WeVideo, Padlet, Ti-Nspire Explorations and Delta Math** (see Schoology for username and password).

Contact & Communication:

My conference period is 8th Period on except Wednesdays
Join Remind: Text 81010 and send this message: **@ge9678c**. Class communications, updates, and reminders will be sent via Remind.

Contact me at the following:

Phone: 281-634-8611

Email: Terrance.Stills@fortbendisd.com

Note: Note: Emails, Schoology messages, and phone calls received after 4:30 PM will, most likely, be responded to during the next business day.

Supplies

- 3 Spiral Notebooks
- Ruler, Red Pens, Color Pencils, Pencils and Erasers
- Graphing Calculator (Link in Schoology)

Classroom Rules ***(See additional norms on signature page)***

- Adhere to FBISD Code of Student Conduct, Dress Code and Attendance Policy
- No eating in class;
- Report to class on-time, remain on task and remain in class until dismissed by your teacher
- Appropriate language used **at all times**

During class, you are to follow classroom rules and procedures to maximize learning time as much as possible. Please know that you can and will learn as long as you work hard and make no excuses. I will do my best to assist you in becoming successful in this class. I have provided my contact information. Never hesitate to let me know if you need any help.

Consequences

1. Verbal/Written Warning
2. Teacher/Student Conference
3. Detention/Parent/Teacher Conference
4. Administration Referral

Homework, Make-Up Work, Late Work and Extra Credit

Homework: assigned generally every class session per week. Students are **required** to check Schoology daily for assignments, upcoming events, and test/quiz dates.

Make-Up Work & Missing assignments: accepted for full credit after an **excused absence** according to school/district policy.

- Accepted for the same amount of time absent with a maximum of fifteen days.
- Due on the immediate return to school: assignments/tests that were scheduled prior to the absence

Late Work Policy: accepted with a 10-point penalty off for each day late (maximum 5 days late). Parents will be notified for consistent zeros entered into the grade book.

Extra credit is "EXTRA" It is a privilege not a right and is only assigned at Teacher's discretion, you CANNOT ask for Extra Credit **if you have not done the work previously assigned**.

Academic Dishonesty: any student engaged in academic dishonesty (includes but not limited to cheating, copying work of another student, plagiarism, etc.) he/she will receive disciplinary actions **and** corresponding grade reduction as outlined in the Student Code of Conduct. These events will be documented in Skyward.

Reteach and Retest

Reteaching and retesting will be given according to FBISD Grading Policy.

Assignment Repair is offered to student at risk of failing a Progress Reporting Period or Grade Period. Parent contact will be made via Skyward.

Tutorials

Tutorials are held on Mondays after school in my classroom

Please review the Digital Citizenship document and complete the Syllabus Agreement

To Do: Complete the Syllabus Acknowledgment with your parent and submit by Friday, August 18, 2023.

I look forward to working with you this year! We will reimagine education as we embrace online learning and the new experiences along the way. My hope is that you learn a lot as you meet and exceed your goals!

Your Teacher,

Coach Terrance Stills