



Course Syllabus

AP Calculus AB/BC | 2020-2021

Objective: AP Calculus AB/BC

Prerequisites: Pre-Calculus

Instructor Contact Information:

Larry McMahan

larry.mcmahan@fremontstem.com

Website:

All course materials (waiver, syllabi, etc.) as well as the link to the lecture videos will be posted on the course website under “AP Calculus AB/BC.” In addition, a copy of the textbook and course materials will be uploaded in the google classroom for the class. classroom.google.com.

Class Times:

Lecture: Thursday 6:00 PM - 7:30 PM

Assistance

Students may email the instructor for assistance with the course. Responses will be by email or at the next class period for general questions.

Required Materials:

- Notebook for taking notes
- Folder for handouts, worksheets, etc.
- Calculator
- Pencils, erasers, etc.

Program Cost: \$575 tuition

Note: the full program cost is due on the first day of lecture, either in person (cash/check) or via Paypal online. If the student for some reason must miss the first day, the fees must be paid by the first attended lecture. The program fee is non-refundable unless unexpected and severe circumstances arise.

Books and Course Material: Please bring a notebook and writing utensil to take notes. Also bring a scientific and graphing calculator if you have one. An electronic copy of Rogawski’s Calculus for AP will be provided in the Google classroom.

Homework: Practice exercises will be assigned relating to each of the topics covered in the course. It is important to do them as they will model the kind of questions given on the AP Exam. The exercises will be graded as feedback to the student as to what is required.



Notes: Please bring a notebook and pencil to take notes. This is not graded or collected, but it is a good habit to always take notes in any class for future reference, studying, or staying awake during lecture.

Exams: The AP Calculus exam will be held on May 4, 2021. All instruction before that time will be geared toward that. After May 4, advanced topics will be covered. These will not be tested as heavily.

Grading: Grades for homework, in-class quizzes, and exams will be inputted into the progress report. The progress report and all grades will be visible to parents.

Tentative Nature of the Syllabus: The contents of this syllabus and attached schedule are tentative in nature and may be subject to change or revision. The instructor holds the right to make changes to the schedule and/or organization of the class as necessary. Students and parents will be identified of any changes via email. In particular, if a high school teacher starts a topic before the dates listed on the syllabus, I will rearrange the class schedule to cover the topic.

Special Accommodations: If your student requires special accommodations, please notify the instructor as soon as possible.

Tentative Schedule *Assignments are noted in italics.*

| Date | Topic |
|-----------------|---|
| Sep 10 – Sep 17 | 1. Precalculus review - Functions, Algebraic and Transcendental, Technology |
| Sep 17 – Oct 1 | 2. Limits - Rates of change, tangent line, limits at infinity, Intermediate Value Theorem |
| Oct 8 – Oct 22 | 3. Differentiation - Definition, derivative as a function, product, quotient chain rule, higher derivatives, derivative of inverse functions. implicit differentiation. |
| Oct 29 – Nov 12 | 4. Applications of derivatives - Linear approximations, extreme values, Mean Value Theorem, L'Hôpital's rule, Newton's method, Antiderivatives. |
| Dec 3 – Dec 17 | 5. Integration - Approximating area, definite integral, Fundamental Theorem of Calculus, parts I and II. Net change as integral of rate, Substitution, Transcendental functions, Exponential growth and decay. |
| Jan 7 – Jan 21 | 6. Application of Integrals - Area between curves, volume, density, average, volumes of revolution, disk method and shell method, work and energy. |
| Jan 28 – Feb 11 | 7. Integration Techniques - Integration by parts, trig integrals, trig substitution, Hyperbolic and inverse hyperbolic integrals, method of partial fractions, improper integrals, probability, numerical methods. |
| Feb 18 – Feb 25 | 8. Further Applications - arc length, surface area, fluid pressure and force, center of mass, Taylor polynomials. |
| Mar 4 – Mar 11 | 9. Differential Equations - Solving, $y' = k(y-b)$, graphical and numerical methods, logistics equation, first order equations. |
| Mar 18 – Mar 25 | 10. Infinite Series - Sequences, Summing an infinite series, absolute and conditional convergence, ratio and root tests, power series, Taylor Series. |
| Apr 1 – Apr 22 | 11. Parametric Equations, Polar Coordinates, and Vector Functions - arc length and speed, polar coordinates, area, arc length and slope in polar coordinates, vectors in the plane, dot product and angle between vectors, calculus of vector valued functions. |
| Apr 29 | Practice AP Test |
| May 6 – June 3 | 12 Differentiation in Several Variables - functions of two or more variables, limits, partial derivatives, differentiability and tangent planes, gradient and directional derivatives, chain rule, optimization, Lagrange multipliers |

**Note: Lecture days are subject to change if unexpected circumstances arise.*