AP Calculus AB Syllabus

1. COURSE INFORMATION

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2. COURSE SCHEDULE

The updated course schedule is kept in our shared Google calendar. Here is the planned calendar.

Topics	Sections	Course Meetings (planned)
Introduction and Summer Assignment	(none)	8/5
Preview of Calculus	LHE 1.1	8/8
Limits – Graphical and Numeric	LHE 1.2	8/9, 8/10, 8/12
Limits – Analytical	LHE 1.3	8/15, 8/16, 8/17
Continuity	LHE 1.4	8/19, 8/22, 8/23
Limits and Asymptotes	LHE 1.5	8/24, 8/26
The Derivative and Tangent Lines	LHE 2.1	8/29, 8/30, 8/31
Defining Limits using Limit Notation	APC	9/2
Est. Limit Values from Graphs	APC	9/2
Est. Limit Values from Tables	APC	9/6
Det. Limit Values from Algebraic Properties of Limits	APC	9/7
Det. Limit Values using Algebraic Manipulations	APC	9/9
Selecting Procedures for Limits	APC	9/9
Defining Continuity at a Point	APC	9/13
Confirming Continuity over an Interval	APC	9/13
Connecting Infinite Limits and Vertical Asymptotes	APC	9/14
Connecting Infinite Limits and Horizontal Asymptotes	APC	9/14
Removing Discontinuities	APC	9/19
Working with the IVT	APC	9/19
Chapter 1 Test	1	9/20
Basic Differentiation Rules	LHE 2.2	9/13, 9/14, 9/16, 9/20, 9/21
Product and Quotient Rules	LHE 2.3	9/26, 9/27, 9/28, 9/30, 10/3
The Chain Rule	LHE 2.4	10/4, 10/5, 10/7
Implicit Differentiation	LHE 2.5	10/10, 10/11, 10/12, 10/14
Related Rates	LHE 2.6	10/17, 10/18, 10/19
The Derivative on AP Exam	(none)	10/21, 10/24, 10/25, 10/26
Chapter 2 Test	LHE 2	10/31
Discuss Chapter 2 Test		11/1

Topics	Sections	Course Meetings (planned)
Extrema on an Interval	LHE 3.1	11/2, 11/4,
Rolle's Theorem	LHE 3.2	11/7, 11/8, 11/9
Increasing and Decreasing Functions	LHE 3.3	11/14, 11/15
Concavity and the Second Derivative Test	LHE 3.4	11/16, 11/18
Optimization Problems	LHE 3.7	11/28, 11/29, 11/30, 12/2
Tangent Line Approximation	LHE 3.8	12/5
Extrema and Optimization on AP Exam.	(none)	12/6, 12/7, 12/9
Final Exam		

3. THE BOOK: LARSON, HOSTETLER, EDWARDS, CALCULUS (8TH EDITION)

University math classes tend to heavily emphasize particular textbooks; it would be accurate to say that most classes are (intentionally) not a study of a particular topic, but a study of a particular book. At this level of mathematics, there are various choices which can be made about notation, order of presentation, statements of theorems and computational techniques. The purpose of a university math textbook is to make an internally consistent set of choices, find a logically consistent order in which to develop a mathematical theory, and present this theory clearly to the students. It is both an educational aid and a reference work.

Thus, for the purposes of this class, Larson/Hostetler/Edwards is *the only calculus book in existence*. We will be covering topics by Chapter and Section. Everything that you need to know for the class is contained in the book. When we support arguments in class, we will be expected to refer to particular statements in the book. Wikipedia and other internet sources may be useful in clarifying the book, or providing alternative perspectives. However, we will regard the book as definitive when we compare it to other sources.

4. PREREQUISITES

Students are expected to have taken a precalculus course which covers algebra (through conic sections, factorization of quadratic polynomials, completing the square, and working with algebraic fractions) and trigonometry (including the basic definitions of $\sin$, $\cos$ and $\tan$, the "fundamental" trigonometric identity $\sin^2 \theta + \cos^2 \theta = 1$, and standard values for trigonometric functions for $30 - 60 - 90$ and $45 - 45 - 90$ triangles). Students should approach the course with an open mind and heart and a desire to learn.

5. COURSE OBJECTIVES

Students will develop a fluent computational ability with limits, differentiation, and integration, including the ability to appropriately choose and apply a calculus technique to a physical or practical situation. Students will understand the conceptual framework of calculus at an overview level, but will generally not be expected to provide proofs of theorems in calculus. Students will develop their algebra and trigonometry skills. Students will be prepared for the AP Calculus AB exam, and for success in a university-level calculus course.

6. ASSIGNMENTS

The course will an exam at the end of each chapter, plus a final exam during each semester. Regular homework will be assigned using Gradescope, with course entry code ZZZ5XK. Reading assignments will be an integral part of the course, with quizzes on the reading assignments given in class. These quizzes may be marked "excused", but cannot be made up. Students with excused absences have the "homework and quiz" portion of their grade computed as if fewer quizzes had been assigned.

7. GRADING AND POLICIES, PEDAGOGY

We will have regular reading assignments, with quizzes at the start of class designed to assess what you've gained from the reading. Class will mostly consist of lecture, with questions, interaction, and time for practice problems. After school homework will complete the process.

The overall course grade is computed from homework, exam, and final grades by the formula:

(1) 20% for each chapter test (total 40%).
(2) 30% for the final exam.

(3) 30% for the homework assignments

(4) 10% for the reading quizzes.

After grades are calculated for each student using these weights, the instructor will rank the students by average and determine thresholds for grades of A, B, C, D, and F. Point scores according to each letter grade are given according to the MDCHS grading policy.

8. Attendance Policy

Students are expected to attend class each day. Missed or late classes will be handled according the MDCHS attendance policy.

9. Academic Honesty and Group Work

As a Monsignor Donovan Catholic High School student, you have agreed to abide by the MDCHS honor code. Lying, cheating, plagiarizing, stealing, harassing, and other behaviors that violate anyone's right to a respectful, safe and professional learning environment conducive to that person's spiritual, intellectual, and personal growth is a violation of the Donovan Code of Conduct found pages 14-18 in the Student/Parent Handbook. The Donovan Code of Conduct states that *unauthorized* assistance may neither be given nor received on assignments in the class. Here is how this works in a university course context:

- The purpose of graded homework is to allow you to practice and receive feedback to improve your understanding of the topic. It is not to evaluate your learning. Therefore, making mistakes on homework is *essential* in helping us to clear up your misconceptions about the material. This will not hurt your course grade.
- It is certainly possible to look up answers for many of the homework questions in the course on the internet. It is also obvious (to me) when you have done so and copied the answers without understanding them. Therefore, it's important that you show supporting work on homework questions, and that you use internet resources wisely– to check the work you've already done, not to avoid doing the work in the first place.
- Working together on the homework assignments is encouraged. You'll see on each question, the statements "I gave assistance to:", "I received assistance from:", "I used internet resource", "I have a question:". If you answer these questions honestly, all of these are authorized.

10. Make-up Examinations

No makeup examinations will be given in the course. You may be marked "excused" from an exam if you have an acceptable excuse for missing the exam (generally, these are medical or legal in nature). In this case, your grade will be computed from the remaining chapter assessments as if the course had fewer exams.

11. Pandemic Plan and Illness Policy

If MDCHS must pivot away from in-class instruction mid-semester and the instructor is neither ill nor caring for ill family members, we will try to film and upload lectures with as many students present as are allowed in the room. Exams will still be given in person if possible, though we may have to schedule multiple seatings in order to meet room capacity requirements. If the students and parents agree, we will provide a (private) list of video recordings of the classes to allow students who miss class to catch up.

12. Note to Parents

This is my first year teaching high school and my first year teaching in a Catholic school context. I have volunteered to teach at Donovan because the school was in need of a calculus class and having trouble finding an instructor. My class at Donovan will be structured like a university course, so there will be differences between this class and the other classes that your student is enrolled in. In addition to calculus, I plan to talk with students about how to successfully manage the upcoming transition between high school and college.

If you have any questions or concerns about the class or about those lessons, please feel encouraged to reach out to me directly at the email address above and I'll be happy to speak with you directly. My goal is to provide a class that is taught in accordance with the needs and values of the students, parents, and school, and your input will be a great help in doing that.