四川大學
SICHUAN UNIVERSITY

Calculus I

Course Number:	MTH 111	**Term:**	Summer, 2021
Instructor:	TBA	**Email:**	
Contact Hours:	60	**Meeting Times:**	TBA
Credits:	4.0		

Course Description:

Calculus is fundamental to many scientific disciplines including physics, engineering, and economics. This calculus course covers differentiation and integration of functions of one variable with applications to real-world situations. Students will study the foundations of calculus, the study of functions and their rates of change. They will learn to measure the instantaneous rate of change of a function as well as the total accumulation of a function over an interval. Additional topics in this course will include differentiation and integration of algebraic, trigonometric, inverse trigonometric, logarithmic, and exponential functions.

Learning Objectives:

Upon successful completion of this course, students will be prepared to:

1. Build appropriate discrete and continuous mathematical models of real-world phenomena
2. Evaluate limits with a range of rational and functions
3. Calculate derivatives of elementary functions
4. Apply derivatives to authentic problems
5. Apply fundamental theorems and concepts of calculus
6. Describe the graphs of function using calculus

Required Textbook and Course Materials:

Title: *Calculus: Early Transcendental*
Author: J. Stewart
ISBN: 978-1285741550

Language of Instruction:

This course is taught entirely in English, including lectures, homework, assignments and examinations. Teaching assistants will be fluent in both English and Mandarin.

Course Prerequisites:

A college level pre-calculus course.

University Policies Class

Class Format

In Person. Course activities, discussions, assignments and resources will be made available at the start of and during the course.

Attendance, Participation and Deliverables

Courses are very intensive and in order to be successful, students need to attend every class. Attendance is required for all lectures and class activities. Class participation is expected from every student and form a significant portion of the final course grade.

All course deliverables (homework assignments and tests) are due on time as assigned. This course includes *no* make-ups, postponements or additional assignments, except for verified medical emergencies. If you miss an exam/assignment due to a non-sanctioned absence, your score on that exam/assignment will be zero.

Academic Dishonesty

All cases of academic dishonesty will be diligently pursued. Academic dishonesty includes representing the work of another as one's own work or cheating by any means. Academic dishonesty also includes aiding, abetting, concealing or attempting such activity. The penalty is automatic failure of the course and possible suspension from the university.

Grading Scale

Student grades will be determined using the following grading scale:

Grading Scale (%)

97-100	A+	77-79	C+
93-96	A	73-76	C
90-92	A-	70-72	C-
87-89	B+	67-69	D+
83-86	B	63-66	D
80-82	B-	60-62	D-
		0-59	F

Professor- and Course-Specific Policies (*Tentative*)

Conceptual Outline

If you draw the graph of a function and then pick a point on the graph, you should be able to draw the line tangent to the graph at that point. You can then estimate the slope of this tangent line by taking the quotient of the rise over the run. The beautiful notion is that for most functions given by a formula one can find another formula (called the derivative) which will enable you to find the exact value of the slope at any given point on the function. This may not seem to be such a big deal at first but consider the fact that at points where a smooth function reaches a maximum or minimum value the slope of the tangent line must be 0. Thus, one can locate the exact maximum and minimum values achieved by a smooth function by using its derivative to locate the places where the function has a flat tangent line. One can probably imagine that this is an important idea. For example, an economist may wish to determine the number of units to produce in order to maximize profit.

Reading

Reading the sections of the textbook corresponding to the class lectures and assigned homework exercises is considered part of the homework assignment; you will be responsible for material in the assigned sections *regardless of whether it is discussed in lecture.* You are expected to read the assigned material in advance of the lecture.

Homework

Assignments will be listed at the beginning of the course. The purpose is to prepare you for the exams. The homework is a very important part of the course. No matter how well you think you understand the material presented in class, you won't really learn it until you do the problems.

Exams

Exams are designed to test your understanding of the calculus principles you have been taught, not your ability to remember formulas or reproduce homework problems that you have already solved. Most problems on the exams will be variations and elaborations of your homework, designed to test whether you can apply mathematical principles to other situations.

Grade Components

Attendance	15%
Homework	25%
Quizzes	20%
Exams	40%
Total	**100%**

Course Schedule (*Tentative*)

Module	Topics
1	Functions New function from old Inverse Function Exponential and Logarithmic functions Derivative motivation The limit of a function Limit laws Asymptotes
2	Continuity Definition of derivative Derivative as a function Derivative of polynomials and Exp Product and quotient rules. Derivatives of trig functions Chain rule
3	Implicit differentiation Derivative of the logarithm Related rates
4	Maximization The Shape of a Graph Antiderivatives Definite integral definition
5	The Fundamental Theorem of Calculus Substitution rule Area between Curves Review Final Exam