Shanghai Jiao Tong University

MA080 Calculus I (Online)

Instructor Information	Gexin Yu Home Institution: College of William & Mary Email: gyu@wm.edu		
Term	June 28, 2021 - July 23, 2021	**Credits**	4 units
Course Delivery	The class will be delivered in the format of online. Other than recorded lecture videos, the instructor will arrange 2 hours' real-time interactions with students per week (via discussion forum, zoom meeting, and WeChat). The workload students are expected to complete to properly pass this course is about 10-15 hours per week.		
Required Texts (with ISBN)	Essential Calculus early transcendentals, by James Stewart, Second Edition. ISBN: 978-1-133-11228-0		
Prerequisite	N/A		

Course Overview

Calculus One focuses on the computations of the derivatives of functions, applications of derivatives, and integrals of functions. Of particular importance are the squeeze theorem, the L'Hospital's rule, the product rule, the quotient rule, the chain rule, the mean value theorems and the fundamental theorem of calculus.

Learning Outcomes

On completion of this subject students should

1. Know very well how to use various ideas, such as the squeeze theorem, the L'Hospitals rule;
2. Find the limits of functions;
3. Understand how to use product rule, quotient rule, chain rule, implicit differentiation rule as well as the properties of the natural logarithmic function to compute the derivatives of a given function;
4. Understand how to apply the derivatives to show if a function is increasing or decreasing, to find the local and absolute maximum and minimum of a function;
5. Apply the fundamental theorem of calculus and the substitution rule to evaluate indefinite and definite integrals and to compute the derivative of a function defined by using an integral.

Grading Policy

Quizzes and Homework	30%
Midterm Examination	30%
Final Examination	40%

Grading Scale is as follows

Number grade	**Letter grade**	**GPA**
90-100	A	4.0
85-89	A-	3.7
80-84	B+	3.3
75-79	B	3.0
70-74	B-	2.7
67-69	C+	2.3
65-66	C	2.0
62-64	C-	1.7
60-61	D	1.0

Class Schedule

Date	Lecture	Readings	Recorded video
Day 1	Basics on functions	1.1-1.2	Video 1
Day 2	The limits of a function	1.3,1.6	Video 2
Day 3	Evaluation of limits	1.4	Video 3
Day 4	Continuity	1.5	Video 4
Day 5	Derivative of a function	2.1-2.2	Video 5
Day 6	Laws for derivatives	2.3-2.4	Video 6
Day 7	Chain rule and implicit differentiation	2.5-2.6	Video 7
Day 8	Application of derivatives	2.7-2.8	Video 8
Day 10	**Mid Exam**	**Chapter 1-2**	
Day 11	Exponential and logarithm functions	3.1-3.2	Video 9
Day 12	Derivatives of exp., log., and inverse trig functions	3.3-3.5	Video 10
Day 13	Inderminate forms and l'Hospital's Rule	3.7	Video 11
Day 14	Max/Min values, and Mean Value Theorem	4.1-4.2	Video 12
Day 15	Use derivative to determine the properties of functions	4.3-4.4	Video 13
Day 16	Optimization problems, Newton's method. Antiderivatives	4.5-4.7	Video 14
Day 17	Areas and distances. The definite integrals	5.1-5.2	Video 15
Day 18	The fundamental theorem of calculus	5.3	Video 16
Day 19	The net change theorem and substitution rule	5.4-5.5	Video 17
Day 20	**Final Exam**	**Chapter 3-5**	