

2309 MATH101 Course Outline

Subject Code : MATH101
Subject Title : CALCULUS I
Course Type : Compulsory
Level : 1
Credits : 3
Teaching Activity : Lecture 45 hours
Prior Knowledge* : Elementary mathematics
Class Schedule :

Class	Week	Time	Classroom	Date
D2	Tue	09:00-11:50	N317	04/09/2023 - 17/12/2023

Instructor : Yang Lei
Contact Number : (853)88972045
E-mail Address : leiyang@must.edu.mo
Office : A313
Office Hour : Monday: 09:00-12:00
Tuesday: 13:00-15:00
Wednesday: 14:30-17:30
Thursday: 10:00-12:00

COURSE DESCRIPTION

The course is an important foundation course in mathematics for all majors in IT. It provides an introduction to calculus that supports conceptual understanding, and helps student to develop skills in abstract thinking, logical reasoning, spatial imagination and self-learning mathematics. Main contents of the course include: Functions, Limits, Continuity and Calculus of One Variable.

TEXT BOOK

Required Text Book:

Thomas's Calculus, Maurice D. Weir and Joel Hass, Thomas' Calculus, 13th Edition

Reference Book:

高等数学（下册）第六版， 同济大学数学系， 高等教育出版社.

INTENDED LEARNING OUTCOMES

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

CO1	Explain the concepts of limits and continuous functions.
CO2	Compute derivatives of basic algebraic and transcendental functions. Compute instantaneous rate of changes.
CO3	Compute differentials and find linear approximation of functions. Use differentiation to solve basic optimization problems.
CO4	Understand the definition of definite integrals. Evaluate indefinite and definite integrals.

CO5	Understand and be familiar with the fundamental theorem of Calculus.
CO6	Apply definite integrals to find the results of problems about volumes, arc length, areas of surfaces and work etc.

Weekly Schedule

Week	Topic	Hours	Teaching Method
1	Functions Functions and their graphs, Trigonometric functions	3	lecture
2	Limits and Continuity Rates of change and tangents to curves, Limit of a Function and Limit Laws	3	lecture
3	Limits and Continuity Definition of the limit, One-Sided limits, continuity, asymptotes of Graphs	3	lecture
4	Differentiation Tangents and the derivative at a point, the derivative as a function, differentiation rules, rate of Change	3	lecture
5	Differentiation Derivatives of trigonometric functions, the chain rule, implicit differentiation	3	lecture
6	Differentiation Related rates, linearization and differentials	3	lecture
7	Applications of Derivatives Extreme values of functions	3	lecture
8	Review Middle term test	3	lecture
9	Applications of Derivatives Mean value theorem ,Monotonic functions, concavity	3	lecture
10	Applications of Derivatives Applied optimization, Newton's method, antiderivatives Integration Area and estimating with finite sums	3	lecture
11	Integration Limits of finite sums, the definite integral, the fundamental theorem	3	lecture
12	Integration Indefinite Integrals and the Substitution Method, substitution and area between curves Applications of Definite Integrals Volumes using cross-sections	3	lecture
13	Applications of Definite Integrals Volumes using cylindrical shells, arc length, areas of surfaces of revolution, work	3	lecture
14	Applications of Definite Integrals Moments and centers of mass,	3	lecture
15	Final Review	3	lecture

ASSESSMENT APPROACH

<u>Assessment method</u>	% weight
1.Attendance (Class participation)	10%
2.Assignment	10%
3.Midterm exam	30%
4.Final exam	50%
Total	100 %

Guideline for Letter Grade:

Marks	Grade
93-100	A+
88-92	A
83-87	A-
78-82	B+
72-77	B
68-71	B-
63-67	C+
58-62	C
53-57	C-
50-52	D
49	F

Notes:

Students are assessed on the basis of continuous assessment (i.e. regular attendance in the class and in the form of individual assignments) and by two reports (a mid-term report and a final report)

ADDITIONAL READINGS

Journals:

Trade and other Publications:

Website: