

2309 MATH103 Course Outline

Subject Code : **MATH103**
Subject Title : **CALCULUS III**
Level : 2
Credits : 3
Teaching : Lecture 45 hours
Activity
Prerequisite : MATH101: Calculus I, MATH102: Calculus II

Class Schedule :	Class	Time		Classroom	Date
	D1	Mon	9:00-11:50	N317	2022/09/4- 2022/12/17

Instructor : Dr. Li WANG
Contact : (853)8897 3008
Number
Email Address : liwang-fi@must.edu.mo
Office : A306a
Office hours : Monday (13:00-15:00)
Tuesday(15:00-18:00)
Wednesday(14:30-17:30)
Friday(13:00-15:00)

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: Analytic Geometry of Space, Partial Derivative, Multivariable Calculus, Integration in vector field.

Textbook(s)

Book name : Thomas' Calculus
Author/Editor : Joel Hass, Christopher Heil, and Maurice D. Weir.
Edition : 14
ISBN : 978-0134438986
Publisher : Pearson
Date : 2017

✧ References

Book name：高等数学.

Author/Editor：同济大学数学系

Edition：7

ISBN：978-7-04-039663-8, 978-7-04-039662-1

Publisher：高等教育出版社

Date：2014

INTENDED LEARNING OUTCOMES

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

Identify the key concepts of function, limits and function continuity;

1. Be able to analyse and evaluate the limits.
2. Understand basic concepts and properties of indefinite and definite integrals.
3. Apply and evaluate indefinite and definite integrals.
4. Be familiar the fundamental theorem of Calculus. Master applications for these three theorems.
5. Understand the concept of improper integral. Be able to find simple improper integral.

These intended outcomes will be exhibit in the following measurable outcomes:

1. Explain concepts
2. Discussion in class room
3. Developing mathematics model
4. Exercises
5. Midterm test
6. Final examination

Schedule

内容 Topic	學時 Hours	教學方法 Teaching Method	備註 Remarks
Vector-values Functions and Motion in Space Integrals of vector function; Projectile Motion, arc length, curvature and normal vectors of a curve, tangential and normal components of acceleration	3	lecture	

Vector-values Functions and Motion in Space Tangential and normal components of acceleration	3	lecture	
Partial Derivatives Function of several variable, limits and continuity, partial derivatives	3	lecture	
Partial Derivatives The chain rule, directional derivatives and gradient, tangent planes	3	lecture	
Partial Derivatives Extreme value, Lagrange Multipliers	3	lecture	
Review	3	lecture	
Midterm	3	lecture	
Multiple Integrals Double integral over rectangles, Double integrals over general region	3	lecture	
Multiple Integrals Double integrals in polar form, area by double integrals,	3	lecture	
Multiple Integrals Triple integrals, moment of centers of mass, triple integrals in cylindrical coordinate	3	lecture	
Integrals and vector fields Line integrals, vector fields and line integrals	3	lecture	
Integrals and vector fields Path independence, conservative fields, Green's theorem	3	lecture	
Integrals and vector fields Surfaces and area, surface integrals, Stokes' theorem	3	lecture	
First-order differential equations First-order linear equations	3	lecture	
Final Review	3	lecture	

ASSESSMENT APPROACH

Assessment method	Percentage %
1. Attendance (Class participation)	10
2. Assignment	10
3. Midterm	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 will be assessed on the basis of continuous assessment (i.e. coursework in the form of individual assignments and midterm exam) and by the end of semester one final examination.

The coursework assessment items evaluate students' ability to apply concepts, to construct knowledge and skills in analysing.

Final examination will primarily cover all contents.