2309 MATH102 Course Outline

Subject Code : **MATH102**
Subject Title : Calculus II
Level : 1
Credits : 3
Teaching Activity : Lecture 45 hours
Prerequisite : MA101(calculus I)
- Functions, Limits, Derivative, Continuity and Calculus of One Variable

Class Schedule :

Class	Time		Classroom	Date
D1	MON	12:30-15:20	C506	2023/09/04-2023/12/17

Instructor : Dr. Weixiong Mai

Email Address : wxmai@must.edu.mo
Office : A304b
Office hours : By appointment.

Course Description

The course is an important foundation course in mathematics for all majors in IT. It provides introduction of calculus that supports conceptual understanding, and helps student to develop skills in abstract thinking, logical reasoning, spatial imagination and self-learning in mathematics. Main contents of the course include: Infinite Series, techniques of integration, vector space and vector functions.

Textbook(s)

Thomas's Calculus 14th edition, by Joel Hass, Christopher Heil and Maurice D.Weir, ISBN：1-292-25322-3.

Reference

高等数学（下册）第六版， 同济大学数学系， 高等教育出版社.

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INTENDED LEARNING OUTCOMES

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

1. Determine the convergence or divergence of infinite series and sequence and find the sum of infinite series.
2. Understand the properties of power series on convergent interval.
3. Identify the key concept and operations of vector and projectile motion in the plane.
4. Identify the concepts of differential equation and its order, solution, general solution, initial conditions and particular solution. Be able to solve first-order linear differential equations.

Schedule (Tentative)

Week	Topic	Hours	Teaching Method
1	**Infinite Sequences and Series** Sequence, squeeze theorem, monotonic bounded theorem	3	lecture
2	**Infinite Sequences and Series** Improper integral over infinite regions, Infinite series, the integral test, the comparison test.	3	lecture
3	**Infinite Sequences and Series** The ratio and root tests, alternating series. The power series, convergence interval of power series.	3	lecture
4	**Infinite Sequences and Series** Taylor series and Maclaurin series.	3	lecture
5	**Techniques of integration** U-sub, integration by parts.	3	lecture
6	**Techniques of integration** Trig integrals and Trig-sub, partial fractions.	3	lecture
7	**Techniques of integration** Improper integrals.	3	lecture
8	**Parametric equations** Parametrization of plane curves, calculus with parametric equations. **Midterm Exam**	3	
9	**Parametric equations** Polar coordinates, graphing polar curves, calculus in polar coordinates. Conic section.	3	lecture
10	**Integration in vector field**	3	lecture

	Vector functions, arclength, line integrals.		
11	**Vectors and Geometry of Space** Vectors, the dot product, the cross product	3	lecture
12	**Vectors and Geometry of Space** Lines and planes in vector equations.	3	lecture
13	**Catch up course**	3	lecture
14	**First-order Differential Equations** Solutions, Slop fields, Euler's method, first –order linear equations and application.	3	lecture
15	**Final exam review**	3	lecture

ASSESSMENT APPROACH

Assessment method	**Percentage**
1.Attendance	**5%**
2.Assignment	**10%**
3.Quiz	**20%**
4. Midterm	**30%**
5.Final exam	**35%**
Total	**100 %**

Guideline for Letter Grade:

Marks	Grade	GPA
90-100	A+	4
85-89	A	4
80-84	A-	3.7
75-79	B+	3.3
70-74	B	3.0
63-69	B-	2.7

59-62	C+	2.3
57-58	C	2.0
55-56	C-	1.7
53-54	D+	1.3
50-52	D	1.0
Below 50	F	n/a

Notes:

Attendance Students should sign attendance on **Wemust** at the beginning of each class. Students with **no more than 5** absence can replace the lowest exam by the final exam.

Assignments There will be assignments every week. I collect assignments to check for completion while students should check the posted solutions for correctness.

Quiz Quizzes are given **every week**. Problems in each quiz are selected mostly from assignments. Topics related to every quiz will be announced in advance. Among all quizzes, 8 most satisfying ones for each student will be counted in the final grade.