國立台灣科技大學 114學年 第2學期　課程大綱

Spring 2026 NTUST Course Outline

授課教師：Iman Adipur

Instructor:Iman Adipurnama

課程名稱：微積分(下)

Course Title：Calculus (II)

2026/11/4

課程代號：CE162B011 Course Code 學分數：4 Credits	必選修：必修/全學年 Required/Electve:Required/Full Yr. 先修課程： Prerequisites
節次教室：F1(TR-409-1) T6(TR-409-1) T7(TR-409-1) W3(TR-409-1) W4(TR-409-1) Time/Location	
專業核心能力： Core Professional Competencies	
課程網址： Course Website	

課程宗旨： Course Objectives

This course aims to develop students' understanding of advanced integration techniques, infinite series, and multivariable calculus. By the end of the course, students will be able to compute arc length and surface area of revolution, and analyze curves defined in parametric and polar forms, including determining slopes, areas, and coordinate conversions.

Students will be able to determine the convergence of sequences and infinite series using appropriate tests, construct and apply power series and Taylor polynomials, and use them for approximation and error estimation. In addition, students will compute partial derivatives, apply the chain rule, interpret gradient vectors, and use linear approximation in modeling problems.

Finally, students will evaluate multiple integrals in Cartesian and polar coordinates and apply them to engineering-related problems involving area, mass, and other physical quantities, with emphasis on conceptual understanding and analytical reasoning.

課程大綱： Outline of Lectures

In this course, we will introduce the parametric equation, polar coordinates, vector, vector function, partial differentiation, and multiple integration. Furthermore, students will practice many techniques of differentiation and integration in the course, and use them to solve both fundamental and practical problems in the physical world.

The contents are as follows:
1. Integral Application (Arc length and Surface Area)
2. Parametric Equations and Polar Coordinates
3. Sequences, Series, and Power Series
4. Partial Derivatives
5. Multiple Integrals

授課方式： Method of Instruction

講授 Lecture：60%

分組討論 Group discussion：15%

案例研討 Case study：10%

操做練習 Practical exercises：15%

	講授 Lecture：%
教科書： Textbooks	Calculus: Early Transcendentals, Metric Edition, 9th Edition, by James Stewart, Daniel K. Clegg, Saleem Watson, Lothar Redlin, 2020 Cengage Learning
參考書目： References	Calculus: Early Transcendentals, Metric Edition, 9th Edition, by James Stewart, Daniel K. Clegg, Saleem Watson, Lothar Redlin, 2020 Cengage Learning The Calculus Story: A Mathematical Adventure, by David Acheson, 1st edition, 2018 Oxford University Press. http://www.wolframalpha.com/ MIT OpenCourseWare: https://ocw.mit.edu/ Coursera: https://www.coursera.org/ Geogebra: https://www.geogebra.org/
修課須知： Notice	All the techniques and tools from Calculus I will be used as they are. There will be no further explanation about that technique. There will be a TA to help review the materials. The course will have a 16-week schedule. The timing will also depend on the progression of the class. If needed, there will be some additional videos as a supplement.
評量方式： Grading	Attendance and Participation: 15% Quiz: 20% TA: 10% Midterm: 25% Final: 30%
備註說明： Notes	This is an EMI (English as a Medium of Instruction) courses. The students at least have taken Calculus I and have a good understanding of mathematics in general. The course will be taught in English. Students should have at least good basic English listening skills. In case something happens during the course, the class can be changed to an online class.