南台科技大學 98 學年度第 2 期課程資訊

課程名稱	工程數學(二)
課程編碼	30N00201
系所代碼	03
開課班級	夜四技電子二甲
開課教師	李憲文
學分	3.0
時數	3
上課節次地點	三 12 13 14 教室 J105
必選修	必修
課程概述	We begin studying ordinary differential equations by deriving them from physical or other problems (modeling), solving them by standard methods, and interpreting solutions and graphs in terms of a given problem.The simplest ordinary differential equations, called ODEs of the first order are to be initiated. In the second chapter we discuss linear ODEs of the second order. This chapter includes the derivation of general and particular solutions. Then we extend the concepts and methods for linear ODEs to orders more than 3.　In chapter 6 we consider the Laplace transform and its application to engineering problems involving ODEs. The Laplace transform is a powerful method for solving linear ODEs and corresponding initial value problems without first determining a general a general solution.
課程目標	It is expected that the students be acquainted with solid knowledge of basic principles, methods, and results, and a clear view what engineering mathematics is all about, and that it requires proficiency in all three phases of problem solving:• Modeling, that is, translating a physical or other problem into a mathematical forms, into a mathematical model; this can be an algebraic equation, a differential equation, a graph, or some other mathematical expression. • Solving the model by selecting and applying a suitable mathematical method, often requiring numeric work on a computer.• Interpreting the mathematical result in physical or other terms to see what it practically means and implies.
課程大綱	第 9 章 向量微分、梯度、散度、旋度 9.1 二度及三度空間向量 9.2 內積 9.3 向量積 9.4 向量場與純量場‧導函數 9.5 曲線‧弧長‧曲率‧ 轉距 9.6 多變數函數 9.7 純量場梯度‧方向導函數

	9.8 向量場散度 9.9 向量場旋度 第 10 章 向量積分‧積分定理 10.1 線積分 10.2 與路境無關之線積分 10.3 雙重積分 10.4 平面之葛林定理 10.6 面積分 10.7 三重積分‧高斯發散定理 10.9 史托克思定理 第 11 章 傅立葉級數、積分及轉換 11.1 傅立葉級數 11.2 週期為 2L 之函數 11.3.偶函數與奇函數‧半程展開式 11.6 三角多項式之近似 11.7 傅立葉積分
英文大綱	Chapter 9 Vector Differential Calculus, Gradient, Div, Curl 9.1 Vectors in 2-space and 3-space 9.2 Inner Product (Dot Product) 9.3 Vector Product (Cross Product) 9.4 Vector and Scalar Functions and Fields. Derivatives 9.5 Curves. Arc Length. Curvature. Torsion 9.6 Calculus Review: Functions of Several Variables 9.7 Gradient of a Scalar Field. Directional Derivative 9.8 Divergence of a Vector Field 9.9 Curl of a Vector Field Chapter 10 Vector Integral Calculus. Integral Theorem 10.1 Line Integrals 10.2 Path Independence of Line Integrals 10.3 Calculus Review: Double Integrals 10.4 Green's Theorem in the Plane 10.5 Surface for Surface Integrals 10.6 Surface Integrals 10.7 Triple Integrals. Divergence Theorem of Gauss 10.8 Stokes's Theorem Chapter 11 Fourier Series, Integral, and Transform 11.1 Fourier Series 11.2 Function of Any Period p＝2L 11.3 Even and Odd Functions. Half-Range Expansions 11.6 Approximation by Trigonometric Polynomials

	11.7 Fourier Integral
教學方式	課堂教授,
評量方法	自行設計測驗,作業／習題練習,
指定用書	高等工程數學
參考書籍	工程數學　黃孟樑編譯 滄海書局
先修科目	微積分、普通物理
教學資源	
注意事項	微積分
全程外語授課	0
授課語言 1	華語
授課語言 2	
輔導考照 1	
輔導考照 2	