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：陳坤隆

Instructor:KUNLONG CHEN

課程名稱：電磁暫態

Course Title：Electromagnetic Transients

2026/11/3

課程代號：ES5010701 Course Code 學分數：3 Credits	必選修：選修/半學年 Required/Electve:Elective/Half Yr. 先修課程： Prerequisites
節次教室：F2(IB-602-1) F3(IB-602-1) F4(IB-602-1) Time/Location	
專業核心能力： Core Professional Competencies	1.電機領域之專業知識。 2.料蒐集、研讀、整理、策劃、設計、系統整合及執行專題研究之能力。 3.研究結果分析、詮釋、組織及撰寫專業論文之能力。 4.創新思考及獨立解決問題之能力。 5.與不同領域人員協調整合團隊合作之能力。 6.良好的國際觀。 7.領導、管理及規劃之能力。 8.終身自我學習成長及應用電機專業技能知識之能力。
課程網址： Course Website	
課程宗旨： Course Objectives	1.Understand fundamentals of electrical transient problems on electric utility and industrial power systems. 2. Learn how to recognize and to solve transient problems in power networks and components. 3. Learn EMTP ATPDraw program to deal with these problems.
課程大綱： Outline of Lectures	Chapter 1 Fundamental Notions about Electrical Transients Chapter 2 The Laplace Transform Method of Solving Differential Equations Chapter 3 Simple Switching Transients Chapter 4 Damping Chapter 5 Abnormal Switching Transients Chapter 6 Transients in Three-Phase Circuits Chapter 7 Transients in Direct Current Circuits, Conversion Equipment and Static Var Controls Chapter 8 Electromagnetic Phenomena of Importance under Transient Conditions Chapter 9 Traveling Waves and Other Transients on Transmission Lines Chapter 10 Control of Generation Chapter 11 Principles of Transient Modeling of Power Systems and Components Chapter 12 System and Component Parameter Values for Use in Transient Calculations and Means to Obtain Them by Measurement Chapter 13 Lightning Chapter 14 Insulation Coordination Chapter 15 Protection of Systems and Equipment Against Transient Overvoltages Chapter 16 Case Studies in Electrical Transients Chapter 17 Equipment for Measuring Transients
授課方式： Method of Instruction	講授 Lecture：50% 分組討論 Group discussion：50% 案例研討 Case study：0%

	操做練習 Practical exercises：0% 講授 Lecture：%
教科書： Textbooks	Allan Greenwood, Electrical Transients in Power Systems, 2nd Edition, John Wiley & Sons, 1991. (Please respect the intellectual property rights, and shall not copy the textbooks arbitrarily)
參考書目： References	J. Arrillaga and N. Watson, Power Systems Electromagnetic Transients Simulation, IET, 2nd, 2018. 2. J. C. Das, Transients in Electrical Systems: Analysis, Recognition, and Mitigation, McGraw-Hill, 2010.
修課須知： Notice	
評量方式： Grading	Attendance - 20 % Homework - 30 % Oral Presentation - 50 %
備註說明： Notes	1.The course is taught in English, but the teacher will review the previous class in Chinese (10 mins) in the next class. 2. Each student should select one chapter to present in English. 3. Several homeworks will be given, and should finish with them by EMTP ATPDraw software.