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：張建國

Instructor:CHIEN-KUO CHANG

課程名稱：局部放電之檢測與辨識

Course Title：Detection and Recognition of Partial Discharges

2026/11/3

課程代號： ES5011701 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： T6(IB-511-2) T7(IB-511-2) T8(IB-511-2)
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.好的國際觀。
7.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

各界對於供電品質之要求，日益殷切，因此有必要為預為診察各種電力設備之絕緣狀態，而在各種診斷方式中，尤以局部放電之辨識，最富潛力。本課程首先探討氣體、液體、固體絕緣材料中，發生局部放電之成因與相關理論；其次，闡述檢測相關之架構與規範，並論及處理量測資料之各種分析方法。進而研討評估絕緣狀態之圖形辨技巧，最後將上述各種技術應用於若干電力設備，並舉例推明局部放電之重要性。本課程之實施，主要採上課講述方進行，並將佐以互動研討
The demand for power supply quality from all sectors is increasingly urgent, making it necessary to assess the insulation status of various electrical equipment in advance. Among the various diagnostic methods, the identification of partial discharge is particularly promising. This course first explores the causes and related theories of partial discharge occurring in gas, liquid, and solid insulating materials. Secondly, it elaborates on the relevant detection frameworks and standards and discusses various analytical methods for processing measurement data. Furthermore, it examines graphical identification techniques for evaluating insulation status. Finally, the course applies these various techniques to several electrical devices and provides examples to illustrate the importance of partial discharge. The course will primarily be conducted through lectures, supplemented by interactive discussions.

課程大綱：
Outline of Lectures

1. The theories of partial discharges in gas, liguid, and solid.
2. Detection of partial discharges
3. Measuring and Noise suppression
4. Feature extraction using data proses
5. Defect Recognition using artificial intelligent
6. Failure Diagnosis using data mining
7. Partial discharges on-line Monitoring
8. On site Test and Standard

授課方式：
Method of Instruction

講授 Lecture：50%

分組討論 Group discussion：0%

	案例研討 Case study：20% 操做練習 Practical exercises：30% 講授 Lecture：%
教科書： Textbooks	teaching handout
參考書目： References	Partial Discharge Detection in High Voltage Equipment, F.H. Kreuger (Author), 1989. IEC 60270: PARTIAL DISCHARGE MEASUREMENTS. IEC 62478 A Prospective Standard for Acoustic and Electromagnetic Partial Discharge Measurements
修課須知： Notice	
評量方式： Grading	Assignments 70%, Final 30%
備註說明： Notes	Method of Instruction： Lecture：__50____%, Practical exercises and presentation：___50___%, Others：___0%_____