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：田維欣

Instructor:Wei-Hsin Tien

課程名稱：機械實習(三)-熱流領域

Course Title：Mechanical Lab (III) – Thermal and Fluid Science

2026/11/3

課程代號：GD3112303 Course Code 學分數：1 Credits	必選修：必修/半學年 Required/Electve:Required/Half Yr. 先修課程： Prerequisites
節次教室：R6(E1-261) R7(E1-261) R8(E1-261) Time/Location	
專業核心能力： Core Professional Competencies	■規劃與執行實驗，並具解析數據之能力。 ■執行工程實務所需技術、技巧及使用現代化工具及儀器操作的能力。 ■設計機械系統、元件、製程或材料設計、製造與跨域整合分析之能力。 ■培養具備專案管理、經費規劃、溝通協調，領域整合與團隊合作之能力。 ■能發掘、分析、應用研究成果及因應複雜且整合性工程問題之能力。
課程網址： Course Website	https://moodle2.ntust.edu.tw/course/view.php?id=18726
課程宗旨： Course Objectives	The purpose of this course is to train the third-year or fourth-year students of the college to learn the ability of analysis and implementation of Thermal/ Fluid Science Experiments, and to inspire students' potentialities of developing new contrivance. The course aims primarily on helping the undergraduate students to develop the abilities of practices and experiments in the respect of Thermal and Fluid Science. It covers the experiments on both the Thermal Science and Fluid Mechanics. The students who have learned theories from the courses of Thermodynamics and Fluid Mechanics could practice their theories in this course. Innovative thinking can be inspired via experiments and illustrations.
課程大綱： Outline of Lectures	

The contents of this course consist of three modules:
A. Lecture on the fundamentals of Thermal/Fluid Science Experiments
B. Experiments on Thermal Science related topics
C. Experiments on Fluid Mechanics related topics

The following section lists the topics of the modules:
A. Lecture on the fundamentals of Thermal/Fluid Science Experiments
1. Lecture on fundamentals of Thermal Science Experiments
2. Lecture on fundamentals of Fluid Science Experiments

B. Experiments on Thermal Science related topics
1. Principles and applications of Mechanical and Electronic Thermometers
2. Heating values of fuels
3. Propagation speed and stability of flames
4. Experiments on reciprocating engines
5. Performance tests of air compressor
6. Experiments on a refrigeration system
7. Measurements of heat conduction coefficient
8. Experiments on heat exchange performance

C. Experiments on Fluid Mechanics related topics
1. Flow rate measurements of closed channel flow
2. Flow rate measurements in open channel flow
3. Application of Bernoulli equation
4. Drag of the bluff body
5. Flow visualization
6. Pipe head loss measurement
7. Performance of pump
8. Flow in the curved pipe
9. Principles and applications of Mechanical and Electronic Thermometers
10. Principle of conduction and convection heat transfer

授課方式： Method of Instruction	講授 Lecture：25% 分組討論 Group discussion：0% 案例研討 Case study：0% 操做練習 Practical exercises：75% 講授 Lecture：%
教科書： Textbooks	None. Course notes and manuals of experiments will be provided.
參考書目： References	
修課須知： Notice	Please see the course website on Moodle for more details.
評量方式： Grading	1. The grades of reports (10 reports) 30 % 2. Midterm exam 30 % 3. Final exam 35 % 4. Attendance rate 5 %
備註說明： Notes	Class & Course Format: E1-261, Three laboratory hours per week.