國立東華大學

教學計劃表 Syllabus

課程名稱(中文) Course Name in Chinese	基礎物理實驗(二)AA			學年/學期 Academic Year/Semester	114/2
課程名稱(英文) Course Name in English	Experimental Physics (II)				
科目代碼 Course Code	PHYS2070AA	系級 Department & Year	學二	開課單位 Course-Offering Department	物理學系
修別 Type	學程 Program	學分數/時間 Credit(s)/Hour(s)	2.0/		
授課教師 Instructor	/吳勝允				
先修課程 Prerequisite					

課程描述 Course Description

運用基本物理知識與邏輯推理，分析解決電磁學、熱物理、與光學物理問題，
且具有測量器材有基礎認識，且具有操作物理實驗儀器的能力。

課程目標 Course Objectives

學習基礎物理學的基本量測與應用

	系專業能力 Basic Learning Outcomes	課程目標與系專業能力相關性 Correlation between Course Objectives and Dept.'s Education Objectives
A	具備物理之基礎背景知識Possessing fundamental knowledge in physical sciences.	●
B	能運用基本物理知識與邏輯推理，分析解決物理問題Being able to analyze and solve physics problems based on basic knowledge in physics as well as logical reasoning.	●
C	對目前測量器材有基礎認識，且具有操作物理實驗儀器的能力Being acquainted with modern equipment and being able to operate them for performing physics experiments.	●
D	能使用基礎電腦程式語言解決物理問題Being able to use basic computer programming for solving physics problems.	○
E	善用各種資訊平台進行論文資料蒐集的能力Being able to use various platforms for data collection benefiting a topical research.	
F	具備科技發展的國際視野以及外語溝通的能力Having an international view of the technology developments and being able to use a foreign language for communications	
G	能整合物理與其它領域知識Being able to integrate the knowledge of physics with that of other fields.	

圖示說明Illustration ：● 高度相關 Highly correlated ○中度相關 Moderately correlated

授 課 進 度 表 Teaching Schedule & Content

週次Week	內容 Subject/Topics	備註Remarks
1	原理講解(一)	
2	Advanced AIoTs Projects with Arduino Uno: Integrating AI and IoTs	
3	Exploring the Thermal Electric Effect: Temperature Measurement and Analysis using a Type-K Thermocouple	
4	Determination of the Planck's Constant Using Light Emitting Diodes (LEDs)	

5	儀器維護	
6	Comprehensive Analysis of Damped Oscillations and Resonance in an RLC Circuit: An Experimental Approach Using AIoTs and Arduino-Based Data Acquisition	
7	Investigation of Helical Spring Structural Characteristics Using Laser Diffraction: Analyzing Interference Patterns to Measure Coil Pitch and Wave Behavior	
8	清明連假	
9	期中考試週 Midterm Exam	
10	原理講解(二)	
11	Analysis of Magnetic Hysteresis Behavior and Energy Loss in Ferromagnetic Materials	
12	Measuring Laser Wavelength via Michelson Interference with OpenCV Image Analysis	
13	儀器維護	
14	Measuring the Speed of Sound Through Doppler Effect with Ultrasonic Waves	
15	Investigating Frequency Dependent AC Susceptibility: Real and Imaginary Components in Magnetic Ma-terials	
16	期末實驗總練習	
17	期末考試週 Final Exam	
18	期末考試週 Final Exam	

教 學 策 略 Teaching Strategies

☑ 課堂講授 Lecture ☑ 分組討論Group Discussion ☐ 參觀實習 Field Trip

☐ 其他Miscellaneous:

教 學 創 新 自 評 Teaching Self-Evaluation

創新教學(Innovative Teaching)

☑ 問題導向學習(PBL) ☑ 團體合作學習(TBL) ☑ 解決導向學習(SBL)

☑ 翻轉教室 Flipped Classroom ☐ 磨課師 Moocs

社會責任(Social Responsibility)

☐ 在地實踐Community Practice ☐ 產學合作 Industy-Academia Cooperation

跨域合作(Transdisciplinary Projects)

☐ 跨界教學Transdisciplinary Teaching ☐ 跨院系教學Inter-collegiate Teaching

☐ 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

學期成績計算及多元評量方式 Grading & Assessments									
配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		測驗 會考	實作 觀察	口頭 發表	專題 研究	創作 展演	卷宗 評量	證照 檢定	其他
平時成績(含出缺席) General Performance (Attendance Record)	10%								
期中考成績 Midterm Exam	0%								
期末考成績 Final Exam	30%								
作業成績 Homework and/or Assignments	60%								
其他 Miscellaneous (_____)									

評量方式補充說明
Grading & Assessments Supplemental instructions

二、評分方式：

1.報告內容須包含實驗結果、數據分析、問題與討論、實驗設計之建議。
2.報告請以PDF於Google Classroom繳交，遲交以零分計算，不得補交。
3.報告之數據一律以電腦做圖，同組報告得數據相同，作圖不同、且內容不得抄襲。
4. 內容抄襲，一律以零分計算。

三、實驗室規則：

1. 實驗室內嚴禁飲食、穿拖鞋、嬉戲。
2. 不得遲到早退。
3. 務必事先預習。

教科書與參考書目（書名、作者、書局、代理商、說明）
Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

教學網站:
https://sites.google.com/gms.ndhu.edu.tw/ndhu-fpexp/

課程教材網址(含線上教學資訊,教師個人網址請列位於本校內之網址)
Teaching Aids & Teacher's Website(Including online teaching information.
Personal website can be listed here.)

教學網站:東華e學苑http://www.elearn.ndhu.edu.tw/moodle/course/enrol.php?id=37064

其他補充說明 (Supplemental instructions)