



教學計劃表 Syllabus

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| 課程名稱(中文) Course Name in Chinese | 半導體光特性分析 | | 學年/學期 Academic Year/Semester | 114/2 |
| 課程名稱(英文) Course Name in English | Optical Properties of Semiconductors | | | |
| 科目代碼 Course Code | EE_D0260 | 系級 Department & Year | 博士 | 開課單位 Course-Offering Department |
| 電機工程學系 | | | | |
| 修別 Type | 選修 Elective | 學分數/時間 Credit(s)/Hour(s) | 3.0/3.0 | |
| 授課教師 Instructor | /吳柏宏 | | | |
| 先修課程 Prerequisite | | | | |
| 課程描述 Course Description | | | | |
| 本課程內容包含:由光的特性開始作介紹,進而探討半導體物理(能帶理論等)與其光學特性之量測方法(穿透光譜、反射光譜、光激發螢光光譜、調制光譜等),更進一步了各種光電元件之應用(如發光二極體、半導體雷射、光檢測器、太陽能電池等) | | | | |
| 課程目標 Course Objectives | | | | |
| 學習半導體材料與元件之物理特性與其量測方式,進一步探討應用於光電元件製作之可行性,並培養學生了解其操作原理。 | | | | |
| 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 | 培育具備電機電子資訊工程等專業技術研發之能力。To cultivate the research and developing ability of electrical, electronics and information engineering。 | | | ● |
| B | 培育系統分析、模擬驗證、實作實現之能力。To cultivate the advanced ability of analysis, verification and implementation of systems。 | | | ○ |
| C | 訓練軟體工具使用與硬體實務驗證相互輔助之能力。To train the auxiliary ability between the utilization of software tool and the verification of the hardware practice。 | | | ● |
| D | 訓練電機電子資訊專業知識與工程實務相互結合運用之能力。To train the integrate ability between professional EECS knowledge and engineering practice。 | | | ● |
| E | 落實高科技研究之分工整合與團體合作之領導能力。To fulfill the leading ability in high-tech research with integration and teamwork cooperation。 | | | ● |
| F | 落實發掘問題、邏輯分析、克服瓶頸與持續學習之能力。To fulfill the ability of question finding, logical analyzing, bottleneck overcoming and continuous learning。 | | | ● |
| G | 了解學術倫理與智慧財產觀念,掌握國內外產業更迭需求與具備多元專長之能力。To obtain the ability of multi-specialization and to meet the industry demand as well as to have the ability of academic ethics and concept of intellectual property。 | | | ○ |
| H | 參與國際研討會了解國際市場變化與未來研究走向,具備純熟科技英文閱讀溝通寫作之能力。To participate the conferences to understand the change of global market and the future trend as well as to have the skillful ability of reading, conversation and technical writing in English。 | | | ● |
| 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 | | | | |

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|----|---|--|
| 2 | Wave Nature of Light(I) | |
| 3 | Wave Nature of Light(II) | |
| 4 | Wave Nature of Light(III) | |
| 5 | Wave Nature of Light(IV) | |
| 6 | | |
| 7 | Semiconductor Science (I) | |
| 8 | Semiconductor Science (II) | |
| 9 | 期中考試週 Midterm Exam | |
| 10 | | |
| 11 | Photoluminescence, Transmittance, Reflectance and Modulation spectroscopy | |
| 12 | Light Emitting Diode | |
| 13 | Stimulated Emission Device Laser | |
| 14 | Photodetectors & Photovoltaic Device | |
| 15 | 期末考試週 Final presentation (I) | |
| 16 | 期末考試週 Final Epresentation (II) | |
| 17 | | |
| 18 | | |

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 Industry-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) | 20% | | | | | | ✓ | | |
| 期中考成績 Midterm Exam | 30% | ✓ | | | | | ✓ | | |
| 期末考成績 Final Exam | 30% | | | ✓ | | | | | Oral presentation |
| 作業成績 Homework and/or Assignments | 20% | | | ✓ | | | | | A4 note 、 Final report |
| 其他 Miscellaneous (_____) | | | | | | | | | |

評量方式補充說明

Grading & Assessments Supplemental instructions

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.)

1. S. O. Kasap , “Optoelectronics and Photonics : Principle and Practice,” 2nd ed., Prentice Hall, (ISBN:0273774174)
2. Pallab Bhattacharya, “Semiconductor Optoelectronic Devices,” 2nd ed., Prentice Hall, 1997

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.)

其他補充說明 (Supplemental instructions)