



## 教學計劃表 Syllabus

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| 課程名稱(中文)<br>Course Name in Chinese                                     | 奈米材料科技                                                                                              |                             |    | 學年/學期<br>Academic Year/Semester    | 115/1                                                                                   |
| 課程名稱(英文)<br>Course Name in English                                     | Nanomaterials and Nanotechnology                                                                    |                             |    |                                    |                                                                                         |
| 科目代碼<br>Course Code                                                    | OE_52400                                                                                            | 系級<br>Department & Year     | 碩士 | 開課單位<br>Course-Offering Department | 光電工程學系                                                                                  |
| 修別<br>Type                                                             | 選修 Elective                                                                                         | 學分數/時間<br>Credit(s)/Hour(s) |    | 3.0/3.0                            |                                                                                         |
| 授課教師<br>Instructor                                                     | /徐裕奎                                                                                                |                             |    |                                    |                                                                                         |
| 先修課程<br>Prerequisite                                                   |                                                                                                     |                             |    |                                    |                                                                                         |
| 課程描述 Course Description                                                |                                                                                                     |                             |    |                                    |                                                                                         |
| 本課程探討不同維度的奈米結構之物理、化學及光電特性，以及相關奈米製成技術原理之介紹。                             |                                                                                                     |                             |    |                                    |                                                                                         |
| 課程目標 Course Objectives                                                 |                                                                                                     |                             |    |                                    |                                                                                         |
| 本課程探討不同維度的奈米結構之物理、化學及光電特性，以及相關奈米製成技術原理之介紹                              |                                                                                                     |                             |    |                                    |                                                                                         |
| 系專業能力<br>Basic Learning Outcomes                                       |                                                                                                     |                             |    |                                    | 課程目標與系專業能力相關性<br>Correlation between Course Objectives and Dept.'s Education Objectives |
| A                                                                      | 具有獨立研究能力。Equipped with abilities of independent research.                                           |                             |    |                                    | ○                                                                                       |
| B                                                                      | 具有光電工程的專業知識及應用能力。Professional knowledge and application ability of Opto-electronic engineering.     |                             |    |                                    | ●                                                                                       |
| C                                                                      | 具有設計與執行實驗、報告撰寫與數據解釋之能力。Abilities to design and execute experiment, write reports, and explain data. |                             |    |                                    |                                                                                         |
| D                                                                      | 使用儀器進行物件的分析及測試。Analysis and test of devices by instruments.                                         |                             |    |                                    |                                                                                         |
| E                                                                      | 具備適當的英文能力，應用於學習與交流。English language ability to study and interac.                                   |                             |    |                                    | ●                                                                                       |
| F                                                                      | 具有良好的溝通與團隊合作的能力。Ability to communicate and teamwork.                                                |                             |    |                                    | ○                                                                                       |
| G                                                                      | 具有創新思維、永續發展及終身學習的能力。Creative thinking, sustainable development, and lifelong learning ability.      |                             |    |                                    | ●                                                                                       |
| 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                                                                      | Overview                                                                                            |                             |    |                                    |                                                                                         |
| 2                                                                      | Introduction to Nanomaterials and Nanotechnology                                                    |                             |    |                                    |                                                                                         |
| 3                                                                      | Physical Chemistry of Solid Surface (I)                                                             |                             |    |                                    |                                                                                         |
| 4                                                                      | Physical Chemistry of Solid Surface (II)                                                            |                             |    |                                    |                                                                                         |

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| 5  | 0-dimensional Nanostructures |  |
| 6  | 0-dimensional Nanostructures |  |
| 7  | 1-dimensional Nanostructures |  |
| 8  | 1-dimensional Nanostructures |  |
| 9  | 期中考試週 Midterm Exam           |  |
| 10 | 2-dimensional Nanostructures |  |
| 11 | 2-dimensional Nanostructures |  |
| 12 | Special Nanomaterials        |  |
| 13 | Special Nanomaterials        |  |
| 14 | Applications for Solar Cells |  |
| 15 | 期末報告<br>Paper report         |  |
| 16 | 期末報告<br>Paper report         |  |
| 17 | 期末考試週 Final Exam             |  |

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| 彈性<br>教學<br>規劃<br>Flexible<br>Teaching<br>Plan | <p>請勾選(至少需勾選1 個項目):<br/>Please tick the box(es). (At least one item is required.):</p> <div style="margin-left: 20px;"> <input type="checkbox"/> 問題討論 Problem-based Discussion<br/> <input type="checkbox"/> 翻轉教學 Flipped Classroom<br/> <input type="checkbox"/> 展演實作 Performance / Practical Presentation<br/> <input type="checkbox"/> 校外參訪 Off-campus Visit<br/> <input type="checkbox"/> 講座活動 Lecture / Seminar<br/> <input type="checkbox"/> 線上作業 Online Assignments<br/> <input checked="" type="checkbox"/> 自主學習 Self-directed Learning<br/> <input type="checkbox"/> 課業輔導 Academic Support<br/> <input type="checkbox"/> 實驗操作 Experiment Operation<br/> <input type="checkbox"/> 遠距教學(同步) Distance Learning (Synchronous)<br/> <input type="checkbox"/> 遠距教學(非同步) Distance Learning (Asynchronous)<br/> <input type="checkbox"/> 其他(請填寫) Others (Please specify.):         </div> <p style="margin-top: 20px;">備註: 本校學期週數自115 學年度起調整為17 週, 為符合1學分18 小時之原則, 請教師規劃安排彈性教學。<br/>Note: From the 115th academic year, the semester will be 17 weeks. Please include flexible teaching activities to meet the required 18 hours per credit.</p> |
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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:

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| 學期成績計算及多元評量方式 Grading & Assessments                                                                                                                                                         |                    |                    |          |          |          |          |          |          |    |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------|--------------------|----------|----------|----------|----------|----------|----------|----|
| 配分項目<br>Items                                                                                                                                                                               | 配分比例<br>Percentage | 多元評量方式 Assessments |          |          |          |          |          |          |    |
|                                                                                                                                                                                             |                    | 測驗<br>會考           | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他 |
| 平時成績(含出缺席)<br>General Performance<br>(Attendance Record)                                                                                                                                    | 10%                |                    |          |          |          |          |          |          |    |
| 期中考成績 Midterm Exam                                                                                                                                                                          | 30%                |                    |          |          |          |          |          |          |    |
| 期末考成績 Final Exam                                                                                                                                                                            | 30%                |                    |          |          |          |          |          |          |    |
| 作業成績 Homework and/or<br>Assignments                                                                                                                                                         |                    |                    |          |          |          |          |          |          |    |
| 其他 Miscellaneous<br>(期末報告)                                                                                                                                                                  | 30%                |                    |          |          |          |          |          |          |    |
| 評量方式補充說明<br>Grading & Assessments Supplemental instructions                                                                                                                                 |                    |                    |          |          |          |          |          |          |    |
| 教科書與參考書目(書名、作者、書局、代理商、說明)<br>Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)                                                                                  |                    |                    |          |          |          |          |          |          |    |
| Textbook:<br>"Nanostructures and Nanomaterials: Synthesis, Properties and Applications", Guozhong Cao, (MSE, University of Washington, USA) Imperial College Press, London, UK, April 2004. |                    |                    |          |          |          |          |          |          |    |
| 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)<br>Teaching Aids & Teacher's Website(Including online teaching information.<br>Personal website can be listed here.)                                       |                    |                    |          |          |          |          |          |          |    |
| e學院                                                                                                                                                                                         |                    |                    |          |          |          |          |          |          |    |
| 其他補充說明 (Supplemental instructions)                                                                                                                                                          |                    |                    |          |          |          |          |          |          |    |