



課 綱 Course Outline  
物理學系應用物理博士班一般組

|                                       |  |                  |               |   |     |
|---------------------------------------|--|------------------|---------------|---|-----|
| 中文課程名稱<br>Course Name in Chinese      | 固態物理(一)  |                  |               |   |     |
| 英文課程名稱<br>Course Name in English      | Solid State Physics (I)  |                  |               |   |     |
| 科目代碼<br>Course Code                   | APH_70100  | 班 別<br>Degree    | 博士班<br>Ph. D. |   |     |
| 修別<br>Type                            | 選修<br>Elective   | 學分數<br>Credit(s) | 3.0           | 時 數<br>Hour(s)  | 3.0 |
| 先修課程<br>Prerequisite                  |  |                  |               |   |     |
| 課程目標<br>Course Objectives             |  |                  |               |   |     |
| 瞭解固態物質的結構及其物理性質。                      |  |                  |               |   |     |
| 系教育目標<br>Dept.'s Education Objectives |  |                  |               |   |     |
| 1                                     | 培養具有研發能力的高科技人才<br>Essential training of professionals for research and development knowledge-intensive industries.                         |                  |               |   |     |
| 2                                     | 培養大學物理師資<br>Professional training for college physics teaching.  |                  |               |   |     |
| 3                                     | 厚植本系所及理工學院之教學研究水準<br>Promoting the teaching and researching potential of the department and the college.                                   |                  |               |   |     |
| 4                                     | 培養物理專業研究人才<br>Professional training in physics research.   |                  |               |   |     |
| 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                                     | 具備物理與相關應用領域之專業知識<br>Possessing professional knowledge in physics and related application fields.   |                  |               | ●   |     |
| B                                     | 能以物理知識與邏輯推理，分析解決物理問題<br>Being able to analyze and solve physics problems based on basic knowledge in physics as well as logical reasoning. |                  |               | ●   |     |

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|---|---|--|
| C | 瞭解當代實驗儀器之原理，並具備操作實驗儀器之能力<br>Understanding the principles of up-to-date equipment and being able to operate them for performing physics experiments. |  |
| D | 能利用電腦處理各類物理問題<br>Being able to use computers for solving various physics problems.  |  |
| E | 對學術倫理有清楚正確之認知<br>Properly and clearly acknowledging the academic ethics.  |  |
| F | 具備以口頭報告及論文寫作發表研究成果之能力<br>Possessing the skills of oral presentation and scientific writing for publishing research findings.                        |  |
| G | 具備科技發展之國際觀及外語溝通能力<br>Having an international view of the technology developments and being able to use a foreign language for communications.       |  |

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

課程大綱  
Course Outline

1. Crystal lattices
2. Structure of solid
3. Crystal Binding
4. Crystal vibrations: phonon and its thermal properties
5. Free electron Fermi Gas
6. Energy bands
7. Semiconductor Crystal
8. Fermi Surface and metals

資源需求評估 (師資專長之聘任、儀器設備的配合...等)  
Resources Required (e.g. qualifications and expertise, instrument and equipment, etc.)

具有各領域之專業師資、相關期刊及圖書、影印機、投影機、幻燈機。

課程要求和教學方式之建議  
Course Requirements and Suggested Teaching Methods

講授、討論、作業、小考、期中及期末考。

其他  
Miscellaneous