



課 綱 Course Outline
通識教育中心學士班

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| 中文課程名稱 Course Name in Chinese | 中級程式設計-科學計算 | | | | |
| 英文課程名稱 Course Name in English | Intermediate Programming for Physical Sciences | | | | |
| 科目代碼 Course Code | GC__64650 | 班 別 Degree | 學士班 Bachelor' s | | |
| 修別 Type | 必修 Required | 學分數 Credit(s) | 2.0 | 時 數 Hour(s) | 2.0 |
| 先修課程 Prerequisite | | | | | |
| 課程目標 Course Objectives | | | | | |
| 了解 Python 程式語言之基本語法與架構，能獨立完成 Python 應用程式以解決物理科學（physical sciences）中的計算問題。 | | | | | |
| （校）教育目標 Objectives of General Education | | | | | |
| 1 | 在地關懷與全球視野 Develop domestic and global perspectives | | | | |
| 2 | 人文素養與科學知識 Achieve humanistic values and scientific literacy | | | | |
| 3 | 全人健康與永續創新 Holistic Wellness and Sustainable Innovation | | | | |
| （校）核心能力 Learning Outcomes | | | | 課程目標與校核心能力相關性 Correlation between Course Objectives and Basic Learning Outcomes | |
| A | 自主學習與創新思考 Autonomous Learning and Creative Thinking | | | ● | |
| B | 康健身心 Physical Fitness and Mental Balance | | | | |
| C | 互動、溝通與解決問題 Interactive Communication and Problem Solving | | | ● | |
| D | 情藝美感 Artistic Feeling and Aesthetic Perception | | | ○ | |
| E | 文化素養與尊重差異 Cultural Literacy and Respect for Differences | | | | |

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| F | 在地關懷與公民責任 Local Commitment and Civic Responsibility | |
| 圖示說明Illustration：● 高度相關 Highly correlated ○ 中度相關 Moderately correlated | | |
| 課程大綱 Course Outline | | |
| 1. Introduction to Python 2. Types of Variables 3. Do Loops 4. Data structures (Lists, Tuples, Dictionaries) 5. If Statements 6. Functions and Modules 7. User Input and Files 8. Classes 9. Numpy and Scipy 10. Matplotlib 11. Programming Projects for Calculus (I) 12. Programming Projects for Calculus (II) 13. Programming Projects for Calculus (III) 14. Programming Projects for General Physics (I) 15. Programming Projects for General Physics (II) 16. Programming Projects for General Physics (III) | | |
| 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.) | | |
| 配合上機實習，需電腦教室支援。 | | |
| 課程要求和教學方式之建議 Course Requirements and Suggested Teaching Methods | | |
| 每周依主題設計程式作業供學生上機與課後練習。 | | |
| 其他 Miscellaneous | | |
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