# 國立中正大學課程大綱
# National Chung Cheng University Syllabus

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| 課號<br>course code | 2365013<br>2708033 | 全英文授課<br>EMI | [X] Yes [ ] No |
| 課程類別<br>course type | [ ]人文關懷課程 [ ]競賽專題課程 [X]問題導向課程<br>[ ]專題導向課程 [ ]總整課程 [X]實作課程<br>[X]實習 [ ]其他 | | |
| 課程名稱（中文）<br>course name | 全球定位系統原理與應用 | | |
| course name | Global Positioning System-Principles and Applications | | |
| academic year /semester | 115 / 1 | 學分<br>credits | 3 |
| 學系（所）<br>department | 地球與環境科學系<br>Earth & Environmental Sciences | 必選修<br>required/selective | [ ] required<br>[X] selective |
| 上課時間<br>Class hours | Tue. 1315 – 1600 | 上課地點<br>Classroom | 地震館 301<br>Earth & Env. Sci. 301 |
| 教師<br>instructor | 鄭凱謙 K. Kevin Cheng | 教師 email<br>Instructor's email | cheng.168@ccu.edu.tw |
| 助教<br>teaching assistant | 請看課程平台<br>check ecourse | 助教 email<br>TA's email | 請看課程平台<br>check ecourse |
| 先修科目<br>prerequisites | None | | |
| 課程概述<br>course descriptions | The principles of Global Positioning System (GPS) is thoroughly discussed, including data acquisition, survey modes (static, kinematic and PPP) and geophysical applications. The extension to Global Navigation Satellite System (GNSS) is also included. | | |
| 學習目標<br>learning objectives | Be acquainted with GPS principle and operations of GPS equipment in the field and the data processing. | | |
| 教科書及參考書<br>textbooks and reference | Required textbook: handouts on Ecourse.<br>References:<br>Xu, Guochang. (Editor) 2010. *Sciences of Geodesy-I, Advances and Furture Direction*, Berlin: Springer-Verlag Berlin Heidelberg. (e-book)<br>Hofmann-Wellenhof, B.,H. Lichtenegger,and J.Collins. 2012. *Global Positioning System: Theory and Practice*. 5th edition New York: Springer-Verlag Wien New York.<br>Teunissen, P.J. And A kleusberg. 1998. Editors. *GPS for Geodesy*. 2nd edition. New York:Springer | | |

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| | ( 請尊重智慧財產權，不得非法影印教師指定之教科書籍 ) |

| 教學要點概述 | |
|---|---|
| **教材編選 teaching materials** | [X]自編教材 handouts [ ]教科書 [ ]其它 |
| **教學方法 teaching method** | [X]講述 lecture [X]小組討論 student discussion [ ]演式法<br>[ ]問題導向學習 [ ]個案研究 [ ]網路教學 [ ]實驗法<br>[ ]其它 |
| **評量方法 evaluation** | This course spans 16 weeks, with the final exam in the 16th week.<br><br>Midterm (35%), Final (35%), Presentation (10%), homework (20%) |
| **教學資源 teaching resources** | [X]課程網站 ecourse [ ]教材電子檔供下載 [ ]實習網站 |
| **教師相關訊息 instructor's information** | None |

## 每週課程內容
## weekly scheduled contents

Class starts on 2026-09-08

| Week | Date | Lecture |
|---|---|---|
| 1 | 09-08 | Introduction |
| 2 | 09-15 | Hands-on: survey with cellphones |
| 3 | 09-22 | Introduction to GPS/GNSS |
| 4 | 09-29 | Introduction to GPS/GNSS |
| 5 | 10-06 | Time and coordinate systems |
| 6 | 10-13 | GPS principles |
| 7 | 10-20 | GPS observables |
| 8 | 10-27 | GPS observables |
| 9 | 11-03 | **Midterm** |
| 10 | 11-10 | Error sources |
| 11 | 11-17 | survey methods |
| 12 | 11-24 | Hands-on: Static GPS survey |
| 13 | 12-01 | Hands-on: RTK eGNSS |
| 14 | 12-08 | Hands-on: Data Processing |
| 15 | 12-15 | Student Presentation |
| 16 | 12-22 | **Final** |
| 17 | 12-29 | Self study – coding: navigation message reading |
| 18 | 01-05 | Self study – coding: observation reading |

## 核心能力
## core competencies

| 核心能力 Core competency | | 本課程與核心能力關聯強度 Degrees of related to core competencies | | | | |
|---|---|---|---|---|---|---|
| | | 1 | 2 | 3 | 4 | 5 |
| 專業能力 Specific competency | 1 持續提升專業素養 | | | | | X |
| | 2 熟悉調查或監測自然環境之技術 | | | | | X |
| | 3 善用科學分析工具及資訊整合軟體 | | | | | X |
| | 4 培養氣候變遷調適與因應知能 | | | | X | |
| 共通能力 General Competence | 1 具備英文及地球與環境科學能力 | | | | X | |
| | 2 了解職場動態以培養跨領域協作能力及規劃自我學習方向 | | | | X | |
| | 3 建立大數據分析能力 | | | | X | |

註：關聯強度以五點量表標示，1 表示沒有關聯，5 表示非常有關聯。