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| **112(1)/2023 Fall Semester TIGP-ESS課程資訊表**  **112(1)/2023 Fall Semester TIGP-ESS course information form** | | | |
| 科目名稱(中文) | | 地震預報 | |
| Course Title (English) | | Earthquake Forecasting | |
| 授課時間  Time | | Wednesday 14:00-16:00 | |
| 授課地點  Location | | Room 7009, RCEC, Academia Sinica | |
| 學分數  Course Credits | | 2 | |
| 主要授課老師 Main Instructors | | 詹忠翰 Chung-Han Chan | |
| 聯絡郵件  E-mail | | [chchan@ncu.edu.tw](mailto:chchan@ncu.edu.tw) | |
| 辦公時間 Office Hours | | by appointment | |
| 課程目標 Course Objectives | | - Obtain earthquake catalogue for earthquake in the globe and Taiwan  - Understand approaches for earthquake statistics  - Practice earthquake probability forecasting approach through statistical seismology | |
| 授課內容 Course Description | | - Introduction, outline, and grouping  - Earthquake and global plate tectonics  - Data analyze  - Approaches for earthquake statistics  - Methods for earthquake probability assessment  - Group presentations for earthquake statistics  - Limitation of seismological approaches  - Earthquake probability assessment considering active fault parameters  - Earthquake catalogues in Taiwan  - Approaches for earthquake statistics through Taiwan cases  - Final exam  - Review the exam results | |
| 教科書/參考書 Textbooks/References | | Tsai, Y.B., 2019. The Next Big Ones: Forecasting the Probability of Large Earthquakes in the World. National Central University Press | |
| 自編教材比例  Self-compiled Textbook/References Proportion(if any) | | 30% | |
| 授課方式 Course Requirements | | ▓講授(Lecture)；  ▓研討(Seminar)；  ■實習/實驗(Internship/Experiment)；  □個別指導(Individual Discussion)；  □其他(Other) | |
| 評量配分比重 Course Grade | | Pop quiz: 50 %;  Final exam: 50 %. | |
| 課程領域Areas | | ■基礎學科(共同)(Basic subjects (common))  □固態地球科學(Solid earth sciences)  □水圈科學(Aquatic sciences)  □應用語言(Applied Languages)  □大氣科學(Atmospheric sciences) | |
| 產業領域Areas | | □地探科技(Geological monitoring technology)  □氣象科技(meteorological science and technology)  □太空科技(Space Technology)  □環保科技(environmental protection science and technology)  □資訊科技(Informational Technology)  □教學研究(Teaching & research)  □地質科技(Geosciences and technology) | |
| 課程進度與內容  Lecture outline and content | | | |
| 週次  week | 主題  Topic | | 授課教師/指定閱讀或作業  Instructor/Readings or assignments |
| **1** | Introduction, outline, and grouping | | Chung-Han Chan |
| **2** | Earthquake and global plate tectonics | | Chung-Han Chan |
| **3** | Data used | | Chung-Han Chan |
| **4** | Methods for forecasting probabilities of large earthquakes | | Chung-Han Chan |
| **5** | Global earthquakes in different depth ranges | | Chung-Han Chan |
| **6** | Group presentations for earthquake forecasting | | Chung-Han Chan |
| **7** | Presentations and discussion | | Chung-Han Chan/Presentations by students |
| **8** | Presentations and discussion | | Chung-Han Chan/Presentations by students |
| **9** | Presentations and discussion | | Chung-Han Chan/Presentations by students |
| **10** | Limitation of these seismological approaches | | Chung-Han Chan |
| **11** | Active fault parameters | | Chung-Han Chan |
| **12** | Earthquakes forecasting considering active faults | | Chung-Han Chan |
| **13** | Earthquake catalogues in Taiwan | | Chung-Han Chan |
| **14** | Earthquake forecasting for Taiwan | | Chung-Han Chan |
| **15** | Earthquake forecasting around the world-1 | | Chung-Han Chan |
| **16** | Earthquake forecasting around the world-2 | | Chung-Han Chan |
| **17** | Final exam | | Chung-Han Chan |
| **18** | Review the exam results | | Chung-Han Chan |
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| 課程所屬學制(Educational System): 博士班(Doctoral Program) | | | |
| 核心能力I: 請點選本課程培養學生具備核心能力之強度指數，並填寫對應之評量方式  Please select core abilities and its corresponding assessments of this course | | | |
| 請勾選學程所訂之核心能力(可複選)  ■獨立思考與研究能力Independent thinking and research capacity  ■進階數理及專業知識能力Advanced mathematical and professional knowledge and ability  ■觀測模擬及分析推理能力Observation simulation and analysis of reasoning ability  ■電腦及程式語言運用能力Computer and programming language proficiency  □國際視野與語文溝通能力International perspective and language communication skills  □專業倫理及服務學習能力Professional ethics and service-learning ability | | | |
| 核心能力II: 請點選本課程培養學生具備核心能力之強度指數，並填寫對應之評量方式  Please select the core abilities and its corresponding assessments of this course | | | |
| |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | | 強度指數 Overall rating of Core Abilities | 1 非常低 Very Low | 2 低 Low | 3 普通 Medium | 4 高 High | 5 非常高 Very High | 評量方式 Corresponding Assessments | | 獨立思考與研究能力 Independent thinking and research capacity | □ | □ | □ | □ | ■ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演  (Products/Creative Performance)  □其他(Others) | | 進階數理及專業知識能力 Advanced mathematical and professional knowledge and ability | □ | □ | □ | □ | ■ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演(Products/Creative Performance)  □其他(Others) | | 觀測模擬及分析推理能力 Observation simulation and analysis of reasoning ability | □ | □ | ■ | □ | □ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演(Products/Creative Performance)  □其他(Others) | | 電腦及程式語言運用能力  Computer and programming language proficiency | □ | □ | □ | □ | ■ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演(Products/Creative Performance)  □其他(Others) | | 國際視野與語文溝通能力International perspective and language communication skills | □ | □ | ■ | □ | □ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演(Products/Creative Performance)  □其他(Others) | | 專業倫理及服務學習之能力 Professional ethics and service-learning ability | ■ | □ | □ | □ | □ | □紙筆測驗/會考(Test/Exam)  □作業練習(Assignments)  □口頭報告/口試(Presentation/Oral Exam)  □專題研究報告(書面)  (Research Report(printed on paper))  □實作/實驗(Practices/Experiments)  □出席/課堂表現(Attendance/Performance)  □學習檔案評量(Portfolios Assessment)  □自我評量/同儕互評  (Self-Assessment/ Peer Assessment)  □作品/創作展演(Products/Creative Performance)  □其他(Others) | | | | |