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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 |
| 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 |
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| 強度指數Overall ratingof 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)  |

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