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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) | 地震資料分析 |
| Course Title (English) | Seismic Data Analysis |
| 授課時間Time | Tue 9a.m.-12a.m. |
| 授課地點Location | 5th floor conference room at IES, Academia Sinica |
| 學分數Course Credits | 3 |
| 主要授課老師Main Instructors | Wu-Cheng Chi |
| 聯絡郵件E-mail | wchi@sinica.edu.tw |
| 辦公時間Office Hours | Wed 3-5p.m. in IES R1510 or by appointment |
| 課程目標Course Objectives | Help build student’s active and passive source waveform analysis capability |
| 授課內容Course Description | Preliminary analysis of seismic dataDiscrete spectral analysisSeismic resolution and fidelityDigital filtersDeconvolutionPractical seismic migrationPractical seismic velocity analysisData fitting and model inversionSpecial topics in seismic processing |
| 教科書/參考書Textbooks/References | Practical Seismic Data Analysis by Hua-Wei Zhouhttps://doi.org/10.1017/CBO9781139027090 |
| 自編教材比例Self-compiled Textbook/References Proportion(if any) |  10% on arrayed seismology |
| 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 | Homework: 40%Quiz: 20%Mid Term: 15%Finals: 25% |
| 課程領域Areas | □基礎學科(共同)(Basic subjects (common)) V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 | V地探科技(Geological monitoring technology) □氣象科技(meteorological science and technology) □太空科技(Space Technology) V環保科技(environmental protection science and technology) □資訊科技(Informational Technology) V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** | Intro | Chi/Text Book |
| **2** | Preliminary analysis of seismic data | Chi/Text Book |
| **3** | Preliminary analysis of seismic data | Chi/Text Book |
| **4** | Discrete spectral analysis | Chi/Text Book |
| **5** | Discrete spectral analysis | Chi/Text Book |
| **6** | Seismic resolution and fidelity | Chi/Text Book |
| **7** | Digital filters | Chi/Text Book |
| **8** | Deconvolution | Chi/Text Book |
| **9** | Mid-Term Exams |  |
| **10** | Practical seismic migration | Chi/Text Book |
| **11** | Practical seismic velocity analysis | Chi/Text Book  |
| **12** | Data fitting and model inversion | Chi/Text Book |
| **13** | Data fitting and model inversion | Chi/Text Book |
| **14** | Special topics in seismic processing | Chi/Text Book |
| **15** | Special topics in seismic processing | Chi/Supplement Materials |
| **16** | Special topics in seismic processing | Chi/Supplement Materials |
| **17** | Special topics in seismic processing | Chi/Supplement Materials |
| **18** | Finals |  |
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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)V獨立思考與研究能力Independent thinking and research capacityV進階數理及專業知識能力Advanced mathematical and professional knowledge and abilityV觀測模擬及分析推理能力Observation simulation and analysis of reasoning abilityV電腦及程式語言運用能力Computer and programming language proficiencyV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 | □ | □ | V | □ | □ | V紙筆測驗/會考(Test/Exam) V作業練習(Assignments) V口頭報告/口試(Presentation/Oral Exam) V專題研究報告(書面)(Research Report(printed on paper)) □實作/實驗(Practices/Experiments) V出席/課堂表現(Attendance/Performance) V學習檔案評量(Portfolios Assessment) V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 | □ | □ | □ | V | □ | V紙筆測驗/會考(Test/Exam) V作業練習(Assignments) V頭報告/口試(Presentation/Oral Exam) V專題研究報告(書面)(Research Report(printed on paper)) V實作/實驗(Practices/Experiments) V出席/課堂表現(Attendance/Performance) V學習檔案評量(Portfolios Assessment) V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 | □ | □ | □ | V | □ | V紙筆測驗/會考(Test/Exam) V作業練習(Assignments) V口頭報告/口試(Presentation/Oral Exam) V專題研究報告(書面)(Research Report(printed on paper)) □實作/實驗(Practices/Experiments) V出席/課堂表現(Attendance/Performance) V學習檔案評量(Portfolios Assessment) V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 | □ | □ | □ | V | □ | □紙筆測驗/會考(Test/Exam) V作業練習(Assignments) □口頭報告/口試(Presentation/Oral Exam) V專題研究報告(書面)(Research Report(printed on paper)) V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 | □ | □ | □ | V | □ | □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) V出席/課堂表現(Attendance/Performance) □學習檔案評量(Portfolios Assessment) V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 | □ | □ | V | □ | □ | □紙筆測驗/會考(Test/Exam) V作業練習(Assignments) □口頭報告/口試(Presentation/Oral Exam) V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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