|  |
| --- |
| **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) | 高等電磁探勘學 |
| Course Title (English) | Advanced Electromagnetic Exploration |
| 授課時間Time | Tue. 2:00-4:00 pm  |
| 授課地點Location | RECE 4032 |
| 學分數Course Credits | 2 |
| 主要授課老師Main Instructors | 張竝瑜 |
| 聯絡郵件E-mail | pingyuc@gmail.com/pingyuc@ncu.edu.tw |
| 辦公時間Office Hours |  By appointment |
| 課程目標Course Objectives |  Learn the the principle to the electromagnetic exploration and methods |
| 授課內容Course Description |  Introduction of the principle to the electromagnetic exploration and the application of the EM methods in the geosciences surveys |
| 教科書/參考書Textbooks/References | 1. Electromagnetic methods in applied geophysics, Editor: Nabighian, SEG, investigation in geophysics no.32. Applied Geophysics, Telford3. Exploration Geophysics of the Shallow subsurfaces, Burger, Princeton Hall PTR |
| 自編教材比例Self-compiled Textbook/References Proportion(if any) | 100% |
| 授課方式Course Requirements | V講授(Lecture)；V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 | 出席表現/attendance 10%、個人報告/personal report50%、期末報告/term report 40% |
| 課程領域Areas | V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) □環保科技(environmental protection science and technology) □資訊科技(Informational Technology) □教學研究(Teaching & research) V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** | 電磁地球物理探勘方法簡介/Introduction to EM Geopysics |  |
| **2** | 電磁學與電磁場原理(1)/Principle of EM theory(1) |  |
| **3** | 電磁學與電磁場原理(2)/Principle of EM theory(2) |  |
| **4** | 岩石與礦物電磁特性/EM characteristics of minerals and rocks |  |
| **5** | 岩石與礦物電磁特性/EM characteristics of minerals and rocks |  |
| **6** | 大地電磁方法原理與儀器/The Magnetotelluric methods |  |
| **7** | 大地電磁野外學期計畫討論/Term projects for MT surveys |  |
| **8** | 暫態時域電磁方法原理與儀器/TEM method |  |
| **9** | 暫態時域電磁方法野外學期計畫討論/ Term projects for TEM method |  |
| **10** | 頻域電磁方法原理與儀器/FEM method |  |
| **11** | 極低頻電磁方法原理/VLF method |  |
| **12** | **個人簡報:極低頻探勘方法之應用/Student report on VLF applications** |  |
| **13** | **個人簡報:頻域電磁方法之應用/Student report on FEM applications** |  |
| **14** | **個人簡報:暫態時域電磁方法之應用/Student report on TEM applications** |  |
| **15** | **個人簡報:大地電磁方法之應用/Student report on MT applications** |  |
| **16** | **學期計畫報告I/student report on term project** |  |
| **17** | **學期計畫報告II/student report on term project** |  |
| **18** | **學期計畫報告III/student report on term project** |  |
|  |  |  |
| 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 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 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 |
|

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| 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 | □ | □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 | □ | □ | □ | □ | 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) □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 | □ | □ | □ | 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) □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 | □ | □ | □ | 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) □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) □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 | □ | □ | 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) □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)  |

 |