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| **113(2)/2025 Spring Semester TIGP-ESS課程資料表**  **113(2)/2025 Spring Semester TIGP-ESS course information form** | |
| 科目名稱(中文) | 人類圈與永續性 |
| Course Title (English) | Anthroposphere and Sustainability |
| 授課時間  Time | Mon 9:00-12:00 |
| 授課地點  Location | Room 4032, 4F, RCEC building, Academia Sinica |
| 學分數  Course Credits | 3 |
| 主要授課老師 Main Instructors | 陳于高、李時雨、陳奕穎、龍世俊、王玉純、溫在弘、袁美華、潘文涵、蕭代基、林宗弘、簡旭伸、周桂田、郭士筠、張靜貞等 |
| 聯絡郵件  E-mail | [sclung@rcec.sinica.edu.tw](mailto:sclung@rcec.sinica.edu.tw) ; [meihuayuan@gate.sinica.edu.tw](mailto:meihuayuan@gate.sinica.edu.tw) |
| 辦公時間 Office Hours | by appointment |
| 課程目標 Course Objectives | Upon completion of the course, students will be able to:   1. Compare and multiple perspectives on the sustainability of the anthroposphere, including the environment- human relationships, societal systems, environmental governance, and integrated methods. 2. Build knowledge about how humans impact environments. 3. Understand the risks and opportunities as the societal system requires a shift. 4. Discover the importance of environmental governance in moving beyond business as usual.   Explore diverse approaches to sustainability challenges that could help build sustainable human-environment systems. |
| 授課內容 Course Description | The course objectives are addressed through four core modules: (1) Module 1: Environment-Human interactions  * Critically analyze the past, present, and future of the anthroposphere and the implications for getting into sustainable development. * Demonstrate a comprehensive understanding of the role of humans as a cause of – but also solution to – environmental problems. * Develop enough understanding to navigate and critically analyze the key aspects and developments in health and environment deterioration.  (2) Module 2: Societal systems  * Engage critically with the resilient urban system through the lens of living-space management. * Consider the interlinkages between different environmental compartments such as water, food, and energy from a management perspective. * Develop a critical understanding of the trajectories of the sustainable system for consumption and production.  (3) Module 3: Environmental Governance  * Understand environmental ethics that are re-shaping social and environmental relationships. * Integrate transition possible in each of the socio-technical frontiers of governance into policy analysis. * Learn and apply methods for risk assessment and integrate relevant natural science knowledge. * Apply methods, concepts, and frameworks to case study material on multiple conflicting interests between government and stakeholders.  (4) Module 4: Integration and Methodology  * Compare and critique frameworks for contextualizing transdisciplinary approaches that might drive and accelerate change towards sustainable development.   Acquire the ability to go from real-world problems with these features to possible solutions. |
| 教科書/參考書 Textbooks/References | Tom Theis, Sustainability: A Comprehensive Foundation, 2015 |
| 自編教材比例  Self-compiled Textbook/References Proportion(if any) |  |
| 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 | 期中考(Midterm exam) 30%  期末考(Final exam) 30%  作業(Assignments) 40% |
| 對應之永續發展目標(SDGs)(請選擇至多3項與教學內容相關的項目)  Corresponding Sustainable Development Goals (SDGs) (Please choose up to 3 items related to the teaching content) | □SDG1消除貧窮No Poverty  ▓SDG2消除飢餓Zero Hunger  ▓SDG3健康與福祉Good Health and Well-being  □SDG4優質教育Quality Education  □SDG5性別平等Gender Equality  ▓SDG6潔淨飲水與衛生Clean Water and Sanitation  ▓SDG7永續能源Affordable and Clean Energy  □SDG8就業與經濟成長Decent Work and Economic Growth  □ SDG9產業永續創新Industry, Innovation, and Infrastructure  □SDG10減少不平等Reduced Inequality  ▓ SDG11永續城市與社區Sustainable Cities and Communities  ▓SDG12永續消費及生產Responsible Consumption and Production  ▓SDG13氣候行動Climate Action  □SDG14水生生態Life Below Water  □SDG15陸地生態Life on Land  □SDG16和平與正義制度Peace, Justice, and Strong Institutions  ▓SDG17全球夥伴Partnerships for the Goals |
| 課程類別Course Category | □ STEAM  □人文關懷Humanities and Social Sciences  ▓跨域課程Interdisciplinary Courses  ▓問題導向Problem-Based Learning  ▓總整課程Integrated Curriculum  □媒體識讀Media Literacy  □創新課程Innovative Curriculum  □自主學習課程Self-Directed Learning  □無None |
| 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) |

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| 課程進度與內容  Lecture outline and content | | | |
| 週次  week | 日期 Date | 主題  Topic | 授課教師/指定閱讀或作業  Instructor/Readings or assignments |
| **1** | 2/17 | Introduction to Anthroposphere and Sustainability: Human vs. Environment | 陳于高 李時雨 |
| **2** | 2/24 | Human Impacts on Environments | 陳奕穎 |
| **3** | 3/3 | Health and Climate | 王玉純 |
| **4** | 3/10 | Environmental and Spatial Epidemiology for Sustainability | 溫在弘 |
| **5** | 3/17 | Resilient Urban System | 周素卿 |
| **6** | 3/24 | Low Carbon Diet and Health | 潘文涵 |
| **7** | 3/31 | Water-Food-Energy Nexus | 袁美華 |
| **8** | 4/7 | Environmental valuation Techniques and Applications | 袁美華 |
| **9** | 4/14 | Sustainable System for Consumption and Production | 蕭代基 |
| **10** | 4/21 | Governance toward Sustainability: Vulnerability and Resilience | 簡旭伸 |
| **11** | 4/28 | Risk Assessment and Urgent Crisis: Climate Risk and Disaster Risk | 李時雨、郭士筠 |
| **12** | 5/5 | Social Science on the Crises of Sustainability | 周桂田 |
| **13** | 5/12 | Partnership: World-wide Collaboration on the Sustainability | 張靜貞 |
| **14** | 5/19 | An Introduction to Transdisciplinary Research (TDR) | 郭士筠 |
| **15** | 5/26 | A Transdisciplinary Approach to the Food Security Challenge | 張靜貞 |
| **16** | 6/2 | Summary: Human and Planetary Future | 陳于高、李時雨 |
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| 課程所屬學制(Educational System): 博士班(Doctoral Program) | | | |

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| 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) | |