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| **111(2)/2023 Spring Semester TIGP-ESS課程資訊表****111(2)/2023 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 ; 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.
5. Explore diverse approaches to sustainability challenges that could help build sustainable human-environment systems.
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| 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.
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| 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) |  (限數字 0~100) |
| 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% |
| 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 to Anthroposphere and Sustainability: Human vs. Environment | 陳于高 李時雨 |
| **2** | Human Impacts on Environments  | 陳奕穎 |
| **3** | Health and Climate | 王玉純 |
| **4** | Environmental and Spatial Epidemiology for Sustainability | 溫在弘 |
| **5** | Resilient Urban System  | 簡旭伸 |
| **6** | Water-Food-Energy Nexus | 袁美華 |
| **7** | Low Carbon Diet and Health | 潘文涵 |
| **8** | Environmental valuation Techniques and Applications | 袁美華 |
| **9** | Sustainable System for Consumption and Production  | 蕭代基 |
| **10** | Midterm exam | --- |
| **11** | Social Science on the Crises of Sustainability | 周桂田 |
| **12** | Governance toward Sustainability: Vulnerability and Resilience  | 林宗弘  |
| **13** | Risk Assessment and Urgent Crisis: Climate Risk and Disaster Risk | 李時雨、郭士筠 |
| **14** | Partnership: World-wide Collaboration on the Sustainability | 龍世俊 |
| **15** | An Introduction to Transdisciplinary Research (TDR) | 郭士筠 |
| **16** | A Transdisciplinary Approach to the Food Security Challenge | 張靜貞 |
| **17** | Summary: Human and Planetary Future  | 陳于高 |
| **18** | Final exam | --- |
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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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