國立中正大學 National Chung Cheng University

課程大綱 Course Syllabus

<table>
<tr><td>學年/學期(Academic Year / Semester)</td><td colspan="3">115-1</td></tr>
<tr><td>課程名稱
(Course name)</td><td colspan="3">跨領域科學專題討論
Interdisciplinary Scientific Seminar on Sustainability and Emerging Technologies</td></tr>
<tr><td>課碼(Course code)</td><td>2708072</td><td>學分數 Credit(s)</td><td>3</td></tr>
<tr><td rowspan="2">授課教師(Instructor)</td><td colspan="3">Chien-Yen Chen 陳建易 (Email: chien-yen.chen@oriel.oxon.org)
Tel: +886-5-2720411 ext. 66220
Gobinda Dey 楊光 (Email: dgobinda1993@gmail.com)</td></tr>
<tr><td colspan="3">■ Professor ☐ Associate Professor ☐ Assistant Professor</td></tr>
<tr><td>授課方式
(teaching methods)</td><td colspan="3">☐ Lab ■ Seminar ■ Student Presentation ■ Lecture ☐ other</td></tr>
<tr><td>先修科目(Prerequisite)</td><td colspan="3">No</td></tr>
<tr><td>課程介紹與教學目標
(Course Description and Objectives)</td><td colspan="3">Course Description
This course centers on interdisciplinary scientific topics, integrating key issues such as carbon emissions, climate change, carbon sequestration, and emerging technological developments. Through seminar discussions and case study analyses, students are guided to understand global environmental challenges and technological solutions from multiple disciplinary perspectives.
The course also emphasizes the development of women scientists and diverse talent cultivation, aiming to nurture future researchers with a global perspective and a strong sense of social responsibility.

Course Objectives
1. To establish fundamental scientific knowledge of carbon emissions and climate change
2. To understand the applications of carbon sequestration technologies and environmental governance
3. To develop interdisciplinary integration and systems thinking skills
4. To explore the roles and training pathways of women scientists in scientific research
5. To introduce emerging technologies in environmental and energy fields
6. To strengthen students' critical thinking and scientific discussion skills</td></tr>
<tr><td>學習評量與成績配分
(Assessment and Grade scale)</td><td colspan="3">Exam… 30%
Homework…..30%
Oral Presentations… ..... 40%</td></tr>
<tr><td>課程要求
(Course Requirements)</td><td colspan="3">Attendance is required.</td></tr>
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課程進度(Course Schedule)	
Week	Contents
Week 01	淨零碳排與全球氣候變遷（Net-Zero Emissions & Climate Change） Net-Zero Emissions & Global Climate Change Global Carbon Emission Trends and Policies (Net-Zero Emissions)
Week 02	全球碳排放趨勢與政策（淨零排放） Fundamentals of Climate Change Science (Greenhouse Gases and Carbon Cycle)
Week 03	氣候變遷科學基礎（溫室氣體、碳循環） Fundamentals of Climate Change Science (Greenhouse Gases and Carbon Cycle)
Week 04	氣候變遷對環境與社會之影響 Impacts of Climate Change on the Environment and Society
Week 05	SDGs 13（氣候行動） SDG 13: Climate Action
Week 06	碳封存與環境調適策略（Carbon Sequestration & Adaptation） Carbon Sequestration and Environmental Adaptation Strategies
Week 07	自然碳匯（森林、紅樹林、土壤） Natural Carbon Sinks (Forests, Mangroves, Soils)
Week 08	人工碳封存技術（CCS、CCUS） Engineered Carbon Sequestration Technologies (CCS, CCUS)
Week 09	**Mid-term Exam**
Week 010	微生物誘導礦化（MICP）在碳封存之應用 Applications of Microbially Induced Carbonate Precipitation (MICP) in Carbon Sequestration
Week 011	碳管理與環境政策 Carbon Management and Environmental Policy
Week 012	**女性科學家的培養與科學職涯發展女性在STEM領域之現況與挑戰** **Development of Women Scientists and Scientific Careers (Status and Challenges in STEM**
Week 013	學術職涯發展與多重角色平衡 Academic Career Development and Work–Life Balance
Week 014	科研領導力與人才培育 Research Leadership and Talent Development
Week 015	SDGs 5（性別平權） SDG 5: Gender Equality
Week 016	**新穎技術與跨域應用（Emerging Technologies）人工智慧（AI）於環境監測與分析** **Emerging Technologies and Interdisciplinary Applications (AI in Environmental Monitoring)**
Week 017	奈米材料與綠色科技 Nanomaterials and Green Technology
Week 018	生物技術與環境修復 Biotechnology and Environmental Remediation