



## 教學計劃表 Syllabus

|   |   |                             |                                 |  |
|---|---|-----------------------------|---------------------------------|--|
| 課程名稱(中文)<br>Course Name in Chinese  | 氣候變遷科學基礎  |                             | 學年/學期<br>Academic Year/Semester | 113/1  |
| 課程名稱(英文)<br>Course Name in English  | Fundamentals of Climate Change Science                  |                             |                                 |  |
| 科目代碼<br>Course Code   | GC_67710  | 系級<br>Department & Year     | 校核心                             | 開課單位<br>Course-Offering Department<br>通識教育中心                                       |
| 修別<br>Type  | 選修 Elective   | 學分數/時間<br>Credit(s)/Hour(s) | 2.0/2.0                         |  |
| 授課教師<br>Instructor  | /張世杰  |                             |                                 |  |
| 先修課程<br>Prerequisite  |   |                             |                                 |  |
| 課程描述 Course Description   |   |                             |                                 |  |
| <p>This course is aiming in providing students from different fields with fundamental knowledge of climate change, including:</p> <ul style="list-style-type: none"> <li>- Phenomena of climate change</li> <li>- Causes of climate change</li> <li>- Interactions of climate change and ecosystems</li> <li>- Mitigation and adaptation</li> </ul> <p>For each of the above topics, diverse material will be given in the classes, including lectures, demonstration of research equipments, and documentary movies.</p> |   |                             |                                 |  |
| 課程目標 Course Objectives  |   |                             |                                 |  |
| <p>Global climate change is one of the main threatens to human beings and Earth's ecosystems in the 21st century. This course is aiming in providing students from different fields with the fundamental sciences of climate change, the impacts of and adaptation to climate change.</p>   |   |                             |                                 |  |
| (校)核心能力<br>Learning Outcomes  |   |                             |                                 | 課程目標與校核心能力相關性<br>Correlation between Course Objectives and Basic Learning Outcomes |
| A   | 自主學習與創新思考Autonomous Learning and Creative Thinking      |                             |                                 | ○  |
| B   | 康健身心Physical Fitness and Mental Balance                 |                             |                                 | ○  |
| C   | 互動、溝通與解決問題Interactive Communication and Problem Solving |                             |                                 | ●  |
| D   | 情藝美感Artistic Feeling and Aesthetic Perception           |                             |                                 | ○  |
| E   | 文化素養與尊重差異Cultural Literacy and Respect for Differences  |                             |                                 | ●  |
| F   | 在地關懷與公民責任Local Commitment and Civic Responsibility      |                             |                                 | ●  |
| 圖示說明Illustration : ● 高度相關 Highly correlated ○ 中度相關 Moderately correlated  |   |                             |                                 |  |
| 授課進度表 Teaching Schedule & Content   |   |                             |                                 |  |
| 週次Week  | 內容 Subject/Topics                                       |                             |                                 | 備註Remarks  |
| 1   | 2024/09/09<br>Course introduction                       |                             |                                 |  |

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|----|---|--|
| 2  | 2024/09/16<br>Phenomena of climate change (I)<br>Can We Cool the Planet?   Full Documentary I NOVA   PBS<br>( <a href="https://www.youtube.com/watch?v=PeYJTluQ5tM&amp;t=24s">https://www.youtube.com/watch?v=PeYJTluQ5tM&amp;t=24s</a> ) |  |
| 3  | 2024/09/23<br>Phenomena of climate change (II)<br>- The changing air temperature  |  |
| 4  | 2024/09/30<br>Phenomena of climate change (III)<br>- The changing hydrological system   |  |
| 5  | 2024/10/07<br>Students' presentation: Environmental change of my country  |  |
| 6  | 2024/10/14<br>Causes of climate change (I)<br>- Anthropogenic greenhouse gas emissions  |  |
| 7  | 2024/10/21<br>Causes of climate change (II)<br>- Other radiative forcings   |  |
| 8  | 2024/10/28<br>Causes of climate change (III)<br>- Positive and negative feedbacks in the global climate system  |  |
| 9  | 2024/11/04<br>Interaction of climate change and ecosystems (I)<br>- Global carbon budget and its relation to climate system   |  |
| 10 | 2024/11/11<br>Midterm Exam  |  |
| 11 | 2024/11/18<br>Interaction of climate change and ecosystems (II)<br>- Field excursion to DNDF flux research site/FLSF solar farm (09:00-13:00, 4 hours)  |  |
| 12 | 2024/11/25<br>Break<br>- Hand in the report of field excursion  |  |
| 13 | 2024/12/02<br>Interaction of climate change and ecosystems (III)<br>- Challenges in predicting forest carbon sink   |  |
| 14 | 2024/12/09<br>Mitigation and adaptation (I)<br>- Pathways towards 2050 net-zero   |  |
| 15 | 2024/12/16<br>Mitigation and adaptation (II)<br>- Afforestation or solar farming? A case discussion in Taiwan   |  |
| 16 | 2024/12/23<br>Mitigation and adaptation (III)<br>- Nationally Determined Contribution (NDC): presented by students from different countries (1)   |  |
| 17 | 2024/12/30<br>Mitigation and adaptation (IV)<br>- Nationally Determined Contribution (NDC): presented by students from different countries (2)  |  |
| 18 | 2025/01/06<br>- Hand in the final report<br>- Optional discussion   |  |

教學策略 Teaching Strategies

- 課堂講授 Lecture       分組討論 Group Discussion       參觀實習 Field Trip  
 其他 Miscellaneous:

教學創新自評 Teaching Self-Evaluation

創新教學 (Innovative Teaching)

- 問題導向學習 (PBL)       團體合作學習 (TBL)       解決導向學習 (SBL)  
 翻轉教室 Flipped Classroom       磨課師 Moocs

社會責任 (Social Responsibility)

- 在地實踐 Community Practice       產學合作 Industry-Academia Cooperation

跨域合作 (Transdisciplinary Projects)

- 跨界教學 Transdisciplinary Teaching       跨院系教學 Inter-collegiate Teaching  
 業師合授 Courses Co-taught with Industry Practitioners

其它 other:

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學期成績計算及多元評量方式 Grading & Assessments

| 配分項目<br>Items                    | 配分比例<br>Percentage | 多元評量方式 Assessments |          |          |          |          |          |          |                              |
|----------------------------------|--------------------|--------------------|----------|----------|----------|----------|----------|----------|------------------------------|
|                                  |                    | 測驗<br>會考           | 實作<br>觀察 | 口頭<br>發表 | 專題<br>研究 | 創作<br>展演 | 卷宗<br>評量 | 證照<br>檢定 | 其他                           |
| 平時成績 General Performance         | 20%                |                    |          |          |          |          |          |          | Participation and discussion |
| 期中考成績 Midterm Exam               | 40%                | ✓                  |          |          |          |          |          |          |                              |
| 期末考成績 Final Exam                 | 40%                |                    |          | ✓        | ✓        |          |          |          |                              |
| 作業成績 Homework and/or Assignments |                    |                    |          |          |          |          |          |          |                              |
| 其他 Miscellaneous (_____)         |                    |                    |          |          |          |          |          |          |                              |

評量方式補充說明

Grading & Assessments Supplemental instructions

教科書與參考書目 (書名、作者、書局、代理商、說明)

Textbook & Other References (Title, Author, Publisher, Agents, Remarks, etc.)

課程教材網址(含線上教學資訊, 教師個人網址請列位於本校內之網址)

Teaching Aids & Teacher's Website(Including online teaching information. Personal website can be listed here.)

其他補充說明 (Supplemental instructions)