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②图玄東華大學

教學計劃表 Syllabus

| 47.4 1 24 12 | | | | | | | | |
|------------------------------------|-------------------------------------|-------------------------------|--|---------------------------------------|---------------------------------|--|-------|--|
| 課程名稱(中文) Course Name in Chinese | 大氣科學概論 | | | | 學年/學期 Academic Year/Semester | | 113/1 | |
| 課程名稱(英文) Course Name in English | Introduction to Atmospheric Science | | | | | | | |
| 科目代碼 Course Code | NRES40120 | 系級 Department 學四 & Year | | 開課單位 Course-Offering Department | 自然資源與環境學系 | | | |
| 修別 Type | 學程 Program | 學分數/時間 Credit(s)/Hour(s) | | | 3.0/3.0 | | | |
| 授課教師 Instructor | /張有和 | | | | | | | |
| 先修課程 Prerequisite | | | | | | | | |
| 課程描述 Course Description | | | | | | | | |

課程描述 Course Description

本課程講授大氣的組成成份與結構、大氣的能量、氣溫、水氣、雲、降水、大氣運動-風、氣團、鋒面等主要天氣現 象的特性,最後講授全球氣候的特徵,氣候變遷,以及空氣污染等課題。本課程安排學生參觀花蓮氣象雷達站,讓學 生了解氣象觀測的實務。課程設計先介紹造成大氣流動的基本因素包括能量來源、地球溫度分布與四季變化原因、水 的三相變化與能量轉換所造成之大氣現象、大氣壓力造成風場流動與不同氣團間能量交換等,第二部分介紹不同尺度 之大氣變化

Course Objectives 課程目標

介紹大氣中各種的現象,其演變規律與人類活動對它的影響。

| | 条專業能力 Basic Learning Outcomes | 課程目標與系專業能 力相關性 Correlation between Course Objectives and Dept.'s Education Objectives |
|---|---|---|
| A | 具備自然科學與社會科學的基礎知識To be knowledgeable of fundamental theories in the natural and social sciences. | • |
| В | 具備觀察、理解、闡釋自然環境與人類社會互動及變遷關係的能力To be able to observe, understand, and interpret the changing interactions of natural resources and human society. | 0 |
| С | 具備多元資料收集策略、閱讀論文、撰寫環境報導及創意口頭報告的能力To have the ability to collect data, understand scientific literature, and write and present environmentally related reports. | |
| D | 能終身學習、對環境維持熱情、關懷、並願意做出對在地環境獻身的承諾To cultivate the values of lifelong learning, to maintain enthusiasm and concern for the environment, and to develop commitment to the local environment. | |
| Е | 具備環境倫理觀、社會責任感與社會實踐力To develop and implement environmental ethics and social responsibility. | |
| F | 具備獨立思考、溝通協調與團隊合作的能力To think independently, to communicate effectively, and to cooperate with others as a team. | |
| G | 具備基本外國語文能力The be able to communicate in a foreign language. | |
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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 | 2024.09.12 課程介紹 chl Earth and Its Atmosphere | |

| 2 | ch2 Energy: Warming Earth and the Atmosphere ch3 Seasonal and Daily Temperatures | | | | | |
|---|---|--|--|--|--|--|
| 3 | ch4 Atmospheric Humidity | | | | | |
| | ch5 Condensation: Dew, Fog, and Clouds | | | | | |
| 4 | ch6 Stability and Cloud Development ch7 Precipitation | | | | | |
| 5 | ch8 Air Pressure and Winds ch9 Wind: Small Scale and Local Systems | | | | | |
| 6 | ch10 Wind: Global Systems | | | | | |
| 7 | ch11 Air Masses and Fronts | | | | | |
| 8 | ch12 Middle-Latitude Cyclones | | | | | |
| 9 | 期中考試週 Midterm Exam 期中考試週 Midterm Exam ch1-12章 | | | | | |
| 10 | ch13 Weather Forecasting | | | | | |
| 11 | ch14 Thunderstorms ch15 Tornadoes | | | | | |
| 12 | ch16 Hurricanes | | | | | |
| 13 | ch17 Global Climate | | | | | |
| 14 | ch18 Earth's Changing Climate | | | | | |
| 15 | ch19 Air Pollution | | | | | |
| 16 | ch 20 Light, Color, and Atmospheric Optics | | | | | |
| 17 | 期末考試週 Final Exam | | | | | |
| 18 | 補充教學時間 | | | | | |
| 教學策略 Teaching Strategies | | | | | | |
| ✓ 課堂講授 Lecture | | | | | | |
| 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 Industy-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: | | | | | | |

| 學期成績計算及多元評量方式 Grading & Assessments | | | | | | | | | |
|--|------------|--------------------|----------|----------|----------|----------|----------|----------|----|
| 配分項目 | 配分比例 | 多元評量方式 Assessments | | | | | | | |
| Items | Percentage | 測驗 會考 | 實作 觀察 | 口頭 發表 | 專題 研究 | 創作 展演 | 卷宗 評量 | 證照 檢定 | 其他 |
| 平時成績(含出缺席) General Performance (Attendance Record) | 20% | | | | | | | | |
| 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.)

Ahrens & Henson (2016) Meteorology Today: An Introduction to Weather, Climate, and the Environment. 11/E, Cengage Learning. 高立出版集團代理進口

Table of Contents:

- 1. Earth and Its Atmosphere
- 2. Energy: Warming Earth and the Atmosphere
- 3. Seasonal and Daily Temperatures
- 4. Atmospheric Humidity
- 5. Condensation: Dew, Fog, and Clouds
- 6. Stability and Cloud Development
- 7. Precipitation
- 8. Air Pressure and Winds
- 9. Wind: Small-Scale and Local Systems
- 10. Wind: Global Systems
- 11. Air Masses and Fronts
- 12. Middle-Latitude Cyclones
- 13. Weather Forecasting
- 14. Thunderstorms
- 15. Tornadoes
- 16. Hurricanes
- 17. Global Climate
- 18. Earth's Changing Climate
- 19. Air Pollution
- 20. Light, Color, and Atmospheric Optics

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.)

https://elearn4.ndhu.edu.tw/moodle/course/view.php?id=9537

| 其他補充說明(| (Supplemental | instructions |
|---------|---------------|--------------|
| | | |