



教學計劃表 Syllabus

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 & Year	學四	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

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

課程目標 Course Objectives

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。

系專業能力

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.	●
B	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.	○
C	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.	
E	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.	

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
 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:

學期成績計算及多元評量方式 Grading & Assessments

配分項目 Items	配分比例 Percentage	多元評量方式 Assessments							
		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 General Performance	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)