

# 0702M131

## Introduction to Meteorology and Climate

**Instructor:** TBA

**Time:** October 16, 2023 - November 17, 2023

**Office Hours:** 2 hours (according to the teaching schedule)

**Contact Hours:** 60 (50 minutes each)

**Credits:** 4

**E-mail:** TBA

### Course Description

This is a survey course of weather and climate for non-meteorology majors, covering a wide variety of topics to help you understand the science behind Earth's weather and climate processes, including the basic physical principles that explain the structure of the atmosphere and the development of atmospheric and ocean-atmosphere phenomena such as ice storms, thunderstorms, polar vortices, tornadoes, hurricanes, and other extreme weather events. We will also discuss the tools (instrumentation and observation) used by meteorologists and climatologists to understand these processes and phenomena.

### Course Goals

Upon completion of the course, students will be able to demonstrate knowledge and understanding of the following topics:

- Describe the atmosphere's structure and how meteorological parameters (temperature, air pressure, humidity) vary in time and space;
- Explain the earth's heat budget, including the variations of solar energy input, the distribution of heat and temperature lags;
- Describe the global circulation of the atmosphere, frontal systems and atmospheric motion, including the forces that influence the wind;
- Explain how air masses are formed, and how air masses relate to fronts, cyclones, thunderstorms and hurricanes;
- Describe the Earth's climate and the climate classification system, and discuss the major causes and consequences of climate change;
- Describe how meteorological observations are performed and how they are used in the work of weather forecasters.

### **Required Textbook(s)**

*Meteorology Today: An Introduction to Weather, Climate, and The Environment*, 11th edition, Cengage Learning, C. Donald Ahrens, Robert Henson, 2015, ISBN 9781305480629.

### **Course Schedule**

Please note that the schedule is meant to give an overview of the major concepts this course. Changes may occur in this calendar as needed to aid in the student's development.

#### **Week 1**

Lecture 1: Earth and Its Atmosphere (Ch 1)

Lecture 2: Earth's Energy Budget (Ch 2)

Lecture 3: Seasonal and Daily Temperatures (Ch 3)

Lecture 4: Atmospheric Humidity (Ch 4)

Course discussion, Q&A, Exam #1 (Chapters 1 to 4)

**Week 2**

Lecture 5: Condensation: Dew, Fog, and Clouds (Ch 5)

Lecture 6: Atmospheric Stability and Cloud Development (Ch 6)

Lecture 7: Precipitation Processes and Measurement (Ch 7)

Lecture 8: Air Pressure and Winds (Ch 8)

Course discussion, Q&A, Exam #2 (Chapters 5 to 8)

**Week 3**

Lecture 9: Atmospheric Motion and Wind Systems (Ch 9)

Lecture 10: Global Atmospheric Circulation (Ch 10)

Lecture 11: Air Masses and Weather Fronts (Ch 11)

Lecture 12: Mid-Latitude Cyclones (Ch 12)

Course discussion, Q&A, Exam #3 (Chapters 9 to 12)

**Week 4**

Lecture 13: Weather Forecasting (Ch 13)

Lecture 14: Thunderstorms (Ch 14)

Lecture 15: Tornadoes (Ch 15)

Lecture 16: Hurricanes (Ch 16)

Course discussion, Q&A, Exam #4 (Chapters 13 to 16)

**Week 5**

Lecture 17: Global Climate Patterns and Classification (Ch 17)

Lecture 18: Earth's Changing Climate (Ch 18)

Lecture 19: Air Pollution (Ch 19)

Lecture 20: Light, Color, and Atmospheric Optics (Ch 20)

Final Exam (Chapters 1 to 20)

## Grading Policy

Type	Percentage
Daily Homework (#1-#20)	40% of grade
Regular Weekly Exams (#1-#4)	40% of grade
Final Exam	20% of grade
Total	100%

### *Readings from the textbook*

Students are expected to read the required pages from the textbook prior to the class session in which they are discussed. We will cover one chapter per lecture.

### *Exams/Homework*

Four regular weekly exams and 20 daily homework assignments will be offered throughout the course for students to practice their concept understanding and to prepare for the lectures. The daily homework assignments will be distributed to students at the beginning of each lecture and will be due by the end of the same day. The weekly exams will be conducted on Friday of the first 4 weeks. Late homework/exams will NOT be accepted, except in the case of a documented medical reason (documentation is required)

## Grading Scale

The instructor will use the grading system as applied by JNU:

Definition	Letter Grade	Score
Excellent	A	90~100
Good	B	80~89
Satisfactory	C	70~79
Poor	D	60~69
Failed	E	Below 60

## **Academic Integrity**

As members of the Jinan University academic community, students are expected to be honest in all of their academic coursework and activities. Academic dishonesty, includes (but is not limited to) cheating on assignments or examinations; plagiarizing, i.e., misrepresenting as one's own work any work done by another; submitting the same paper, or a substantially similar paper, to meet the requirements of more than one course without the approval and consent of the instructors concerned; or sabotaging other students' work within these general definitions. Instructors, however, determine what constitutes academic misconduct in the courses they teach. Students found guilty of academic misconduct in any portion of the academic work face penalties that range from the lowering of their course grade to awarding a grade of E for the entire course.