

**PITTSBURG STATE UNIVERSITY  
DEPARTMENT OF PHYSICS**

**Instructor:** Angelyn Hobson

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**Office:** Yates Hall 305; (620) 235-4392

**Office Hours:** See below.

**Course Title:** PHYS 166-01: Introduction to Meteorology

**Term:** Fall 2018

**Meeting Times and Locations:** TR 9:30-10:45, Yates 215

**Textbook:** *Meteorology Today*, C. Donald Ahrens and Robert Henson, 11th Ed., Cengage

**COURSE DESCRIPTION AND PREREQUISITES**

**Catalog Description:** A descriptive survey of atmospheric science integrating the concepts of weather patterns, climate, atmospheric composition and structure, pressure, wind, and impact of pollution. PHYS 167 is a corequisite. *The lecture class is required to take the lab.*

This course is also intended for partial fulfillment of the Pitt State Pathway Curriculum.

**Pitt State Pathway Mission Statement:** The *Pitt State Pathway* curriculum serves as the heart of the university education by fostering interdisciplinary competencies that typify the educated person. It is designed to facilitate the development of key proficiencies including communication and information literacy. The *Pitt State Pathway* curriculum provides a transformational experience that challenges students to think creatively and critically, and to immerse themselves in the productive examination of humans in their global setting. By encouraging the development of skills that promote life-long learning, the *Pitt State Pathway* fosters a sense of personal responsibility, an appreciation of diversity, and an understanding of interconnectedness in our truly global society.

**Essential Study to be covered in this course: Natural World within a Global Context**

Biological, physical, and chemical systems form the context for life. Students need to understand how these systems work, how these change naturally, and how these can change as a result of human activities. The implications of these changes are essential for long-term decision-making. In this course we will:

*Analyze* physical and chemical systems;

*Evaluate* the implications of changes that result from interactions between natural and human systems.

**Companion Element to be covered in this course: Scientific Inquiry**

The scientific method is the systematic approach to understanding the world around us. Through experimentation and hypothesis testing, students will apply analytical skills and appropriate methods of scientific inquiry (i.e. qualitative and quantitative) to solve a variety of research questions. In this course we will:

*Compose* appropriate research questions and hypothesis, drawing from experts, reliable sources, or previously collected data.

*Collect, synthesize, and analyze* data from multiple sources;

*Draw* logical conclusions, assessing for gaps and weaknesses, and addressing potential consequences and implications

*Communicate* results using appropriate delivery methods or formats.

The **Learning Outcome** for Natural World in a Global Context is:

Students will explore global systems conscientiously.

The **Learning Outcome** for Scientific Inquiry is:

Students will analyze data logically.

### **Course Objectives:**

**Natural World within the Global Context:** Level of Student Learning = Milestone I  
Explains physical and chemical processes and human activities that alter them.

**Scientific Inquiry:** Level of Student Learning = Milestone I  
Student will apply the scientific methods to a problem.

Upon completion of this course, students should be able to:

- Discuss the physics and forces controlling atmospheric motion and various weather phenomena
- Analyze meteorological charts, such as surface data, radar, and satellite
- Explain the mechanisms behind cloud development and precipitation
- Summarize common features of severe and hazardous weather
- Discuss human impacts on climate and identify potential climate change scenarios

### **Methods of Assessment:**

To assess the chosen level of student learning for Natural World within a Global Context (Milestone I), students will complete homework and exams to describe and explain biological, physical, and/or chemical processes and how human activities alter them. To assess the chosen level of student learning for Scientific Inquiry (Milestone I), students will complete homework and exams to identify and apply a problem by using scientific methods.

Homework and exam dates are listed below. The final exam will be comprehensive.

### **Grades**

Grades will be based on three unit exams, homework, and the final. Some material over which you will be tested might not be discussed in class, but will be based upon material in the textbook. Students are encouraged to begin homework assignments prior to due date so that they may seek assistance from me if needed. Please notify me in advance if you are going to be absent for an exam so we can schedule a make-up time for you. Final grades will follow this scale based on the percentage of total points earned: >90 % **A**; 75 - 89% **B**; 60 - 74% **C**; 50 - 59% **D**.

Grades will be determined from the following:

**Homework: 30%**

**Tests: 50% (3 exams)**

**Final: 20% (1 exam)**

**Class Participation: up to 5% extra credit**

### **Academic Integrity**

All work submitted for a grade **MUST** be your own original work. *Plagiarism of any type will NOT be tolerated.* You are welcome to use online resources and/or discussions with other students to help you understand concepts and material better, but your answer should be in your own words and not copied from any source. If you are consulting outside sources (a website, book, etc.) to help with your answer, that source should be provided.

*Whenever an outside source is directly quoted, the quote MUST be marked by quotation marks or italics and its source properly acknowledged.* For more information refer to the PSU Code of Student Rights and Responsibilities: Article 30, Academic Misconduct at [http://catalog.pittstate.edu/contentm/blueprints/blueprint\\_display.php?bp\\_listing\\_id=162&blueprint\\_id=124&sid=1&menu\\_id=7980](http://catalog.pittstate.edu/contentm/blueprints/blueprint_display.php?bp_listing_id=162&blueprint_id=124&sid=1&menu_id=7980)

### **Course Outline**

I reserve the right to modify course topics and the presentation as needed. We will not have time for in-depth lectures on every topic. Consequently, you are expected to read the assigned chapters of the textbook (or other materials) before class.

#### **Tentative Dates      Reading by Chapter Earth and Atmospheric Properties**

Aug 21    Syllabus, Introduction, 1. Earth and its Atmosphere

Aug 23    1. Earth and its Atmosphere (continued)

Aug 28    2. Energy: Warming the Earth and the Atmosphere

Aug 30    3. Seasonal and Daily Temperatures

*HW 1 due on Canvas at 11:55pm*

Sept 4    4. Atmospheric Humidity

Sept 6    5. Condensation: Dew, Fog, and Clouds

Sept 11   Complete material and review for exam

*HW 2 due on Canvas at 11:55pm*

#### **Sept 13 – Exam 1**

#### **Tentative Dates      Readings by Chapter Clouds, Precipitation, and Global Patterns**

Sept 18    6. Stability and Cloud Development

Sept 20    6. Stability and Cloud Development (continued)

Sept 25    7. Precipitation

Sept 27    8. Air Pressure and Winds

*HW 3 due on Canvas at 11:55pm*

Oct 2      9. Winds: Small Scale and Local

Oct 4      10. Wind: Global Systems

Oct 9      10. Wind: Global Systems (continued)

Oct 11    *Fall Break*

Oct 16    Complete material and review for exam

## **Oct 18 – Exam 2**

### **Tentative Dates    Readings by Chapter Storms, Climate, and Severe Weather**

Oct 23    11. Air Masses & Fronts  
Oct 25    12. Middle-Latitude Cyclones  
Oct 30    12. Middle-Latitude Cyclones (continued)  
Nov 1    13. Climate  
Nov 6    13 Climate (continued)  
*Nov 8    14. Radar and Thunderstorms: Part I*  
*HW 4 due on Canvas at 11:55pm*  
Nov 13    15. Radar and Thunderstorms: Part I (continued)

## **Nov 15 – Exam 3**

### **Tentative Dates    Readings by Chapter Meteorology Applications**

Nov 20    15. Thunderstorms: Part II and Tornadoes  
*Nov 21-23 Thanksgiving Break*  
Nov 27    15. Thunderstorms: Part II and Tornadoes (continued)  
Nov 29    16. Hurricanes  
*HW 5 due on Canvas at 11:55pm*  
Dec 4    18. Light, Color, and Optics  
Dec 6    Review for final  
*Dec 10-14 Final Exam Week*

Please review the following syllabus supplement:

[https://www.pittstate.edu/registrar/\\_files/documents/syllabus-supplement-spring-2019-updated-1-3-19-.pdf](https://www.pittstate.edu/registrar/_files/documents/syllabus-supplement-spring-2019-updated-1-3-19-.pdf)

### **Minimum Technology Requirement:**

Canvas is required. Please click the link to a Canvas help page:

<https://www.pittstate.edu/it/information-technology-services/canvas.html>

Any technical difficulties, please contact Gorilla Geeks at

<https://www.pittstate.edu/it/gorilla-geeks.html>