

**PITTSBURG STATE UNIVERSITY
DEPARTMENT OF PHYSICS**

Course Title: PHYS 167 Introduction to Meteorology Lab

Term: Fall 2018

Meeting Times and Locations: Yates Room 400

Text: *Exercises for Weather and Climate*, Greg Carbone, 9th Edition, Prentice Hall 2010

Instructor: Angelyn Hobson

Office Location: 305 Yates

Instructor Email: ahobson@pittstate.edu

Office Hours: Monday (10:00am-2:00pm) Tuesday/Thursday (10:45am-12:00pm),

Wednesday (10:00am-12:00pm)

COURSE DESCRIPTION AND PREREQUISITES

Catalog Description: Exercises, activities, and experiments to accompany the PHYS 166 Meteorology lecture. A brief lecture will introduce the laboratory. This lab class is a co-requisite and independent of the lecture, PHYS 166-01.

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 lab, you will 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 lab exercises 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 lab exercises and exams to identify and apply a problem by using scientific methods. Lab and exam dates are listed below.

Instructional Resources:

You will need a *pencil* and a *calculator* (not a cell phone calculator) for this class. The labs will be directly out of the lab manual. **You must wear closed-toe shoes that entirely cover the sides, top, and back of your feet while in the lab. No sandals, clogs, flats, bedroom slippers, or flip-flops are allowed. You will be sent home if you are not wearing appropriate footwear.** No food is allowed in the lab. No cell phone texting is allowed in the lab.

Make-Up Labs:

There will be **no** make-up labs. **You must attend the lab section in which you are enrolled to earn attendance points. You will not be awarded attendance points for a lab that you do not attend.**

Grades:

Grades will be based on exams, quizzes, and attendance. Points will be deducted if you arrive late to the lab or leave the lab early. Grades will be determined from the following:

Attendance: 12 @ 10 points each

Lab Tests: 2 @ 30 points each

Quizzes: 2 @ 10 points each

Grading Scale:

180-200 A

160-179 B

140-159 C

120-139 D

Below 120 F

Tentative Dates:

8/21-8/23 WE WILL NOT MEET THIS FIRST WEEK

8/28-8/30 Lab 1: Vertical Structure of the Atmosphere

9/4-9/6 Lab 2: Earth-Sun Geometry

9/11-9/13 Lab 3: The Surface Energy Budget and Lab 4: The Global Energy Budget

9/18-9/20 Lab 5: Atmospheric Moisture, QUIZ 1

9/25-9/27 Lab 6: Saturation and Atmospheric Stability

10/2-10/4 EXAM 1

NO LABS DURING WEEK OF OCTOBER 8 DUE TO FALL BREAK

10/16-10/18 Lab 7: Cloud Droplets and Raindrops

10/23-10/25 Lab 8: Atmospheric Motion

10/30-11/1 Lab 9: Weather Map Analysis

11/6-11/8 Lab 10: Mid-Latitude Cyclones

11/13-11/15 Lab 12: Thunderstorms and Tornadoes, QUIZ 2

NO LABS DURING WEEK OF NOVEMBER 19 DUE TO THANKSGIVING BREAK

11/27-11/29 Lab 13: Hurricanes

12/4-12/6 EXAM 2 *NOTE THAT THIS IS DURING DEAD WEEK – LAB WILL NOT MEET DURING FINALS WEEK

Please review the following syllabus supplement:

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>