

**PITTSBURG STATE UNIVERSITY  
DEPARTMENT OF PHYSICS**

**Fall 2018**

**Course Name:** PHYS 176 Astronomy Laboratory

**Room:** 405 Yates Hall

**Instructor:** Kyla Scarborough

**Lab Section:** 176-\_\_\_\_\_ **Lab TA:** \_\_\_\_\_

**Course Time:** 2:00-3:50 **Course Days:** M-TH **e-mail:** kscarborough@pittstate.edu or

**Office Hours:** Below

**Phone:** 235-4292

**Office:** 304 Yates Hall

**E-Mail:** k.scarborough@gmail.com

No Canvas messaging

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 Description:** 1 credit hour. Practical experiments related to astronomy. Light and optics, spectra, mechanics, magnetism, radioactivity; sky observations of constellations, planets, stars and galaxies. Corequisite of either PHYS 175 Descriptive Astronomy or PHYS 375 Solar System Astronomy.

### **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.

The laboratory experiments that you will perform are intended to reinforce material from the lecture and to help develop an understanding of the tools and methods of astronomers and scientists in general. This laboratory is designed to expose students to laboratory equipment; to develop laboratory skills.

Students should be able to:

- 1) Perform experiments, graph data, and interpret experimental results
- 2) Apply scientific method and math as a tool in unit conversions, and problem solving.
- 3) Analyze collected data (including appropriate treatment of errors and uncertainties) and generate and communicate conclusions based on the data.
- 4) Demonstrate critical thinking and basic problem solving

### **Method(s) of Assessment:**

To assess the chosen level of student learning for Natural World within a Global Context (Milestone I), students, on laboratory work sheets and final exam, will *describe and explain*, items, principles, and processes related to the student outcomes. (Milestone I)

### Course Rules:

You will need to bring a **pencil (not pen)**, paper, and a **calculator with trig functions that can express results in scientific notation (not a cell phone or i-pad calculator)** to each lab session. You will also need a notebook or folder in which to keep your graded worksheets. **Graded lab worksheets may be used on the final examination. \*Cell phone text messaging and Internet usage are not allowed during lab.\***

### Grading:

**EVALUATION: YOUR GRADE IN THIS CLASS IS DETERMINED BY THE TOTAL NUMBER OF POINTS THAT YOU HAVE.**

1. <b>*Attendance &amp; Participation</b>	12 @7.5 points per lab	90 points
2. Lab Worksheets	12 @ 7.5 points each	90 points
3. <b>1 Lab Final</b>	1 @ 20 points	<b>20 points</b>
	Total Points	200 points

**\*You will not be awarded the full amount of attendance points if you do not fully-participate, calculate your own numerical solutions, and follow directions in lab. Points will also be deducted if you text or otherwise use your phone during lab, if you arrive to lab late, leave the lab early, leave lab before your partner, or do not have a calculator with you when you arrive. No loaning of calculators is allowed.**

**No calculator = -2 Loaning a calculator = -2 Not following directions = -2 each time 5-10 minutes late = -1 More than 10 min late = from -2 to -7 Leaving before partners are finished = -2**

**Leaving before finished = from -2 to -7 Texting during class = -2 each time**

**Using Internet during class = -4 Not using pencil = -2 Not doing own math = -5**

### GRADING SCALE

180-200 POINTS A

160-179 POINTS B

140-159 POINTS C

120-139 POINTS D

Below 120 POINTS F

**ATTENDANCE: Your attendance is required for each lab as is your participation. Lab worksheets will not be graded for labs that you do not attend. Missed labs may not be made up.**

**You will never be awarded attendance points for a lab that you do not attend.**

### TENTATIVE SCHEDULE

M Tu W Th

8/27 8/28 8/29 8/30 Lab 1: Introduction, Planet X, Star Map

**No lab Monday, September 3rd, Labor Day**

9/10 9/4 9/5 9/6 Lab 2: Changing Latitude, Daily & Annual Motion

9/17 9/11 9/12 9/13 Lab 3: Seasons & Length of the Day  
9/24 9/18 9/19 9/20 Lab 4: Extra-solar Planets & Fermi Paradox \*(Bring notebook paper)\*  
10/1 9/25 9/26 9/27 Lab 5: Plate Tectonics

\*10-10 10/2 10/3 10/4 Lab 6: Radioactivity

**No labs October 9-11 due to Fall Break.**

10/15 10/16 10/17 10/18 Lab 7: Mercury Rotation

10/22 10/23 10/24 10/25 Lab 8: Jupiter's Moons & the Speed of Light

10/29 10/30 10/31 11/1 Lab 9: Atmospheres 2 of 3 \*(Bring notebook paper)\*

11/5 11/6 11/7 11/8 Lab 10: Flow of Energy & Emission Spectra

11/12 11/13 11/14 11/15 Lab 11: Sunspots

**No labs November 19-22, Thanksgiving week.**

11/26 11/27 11/27 11/29 Lab 12: Hubble's Law

**12/3 12/4 12/5 12/6 LAB FINAL, DURING DEAD WEEK**

**THERE IS NO LAB ACTIVITY DURING FINALS' WEEK—LAB IS OVER.**

### **Disabilities:**

Any student who, because of a disabling condition, may require some special arrangements in order to meet course requirements should contact me as soon as possible to make necessary accommodations.

### **Plagiarism and Cheating:**

Plagiarism and cheating are serious offenses and may be punished by failure on the exam, paper or project, failure in the course, and/or expulsion from the University.

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)

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>

**Tentative Office Schedule~Kyla Scarborough Fall 2018**

	<b>Monday</b>	<b>Tuesday</b>	<b>Wednesday</b>	<b>Thursday</b>	<b>Friday</b>
<b>9:00-9:50</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>	<b>Lunch</b>
<b>10:00-10:50</b>	<b>Physical Science</b>	<b>Astro Lab Set-up</b>	<b>Physical Science</b>	<b>Office Hours</b>	<b>Physical Science</b>
<b>11:00-11:50</b>	<b>Office Hours</b>	<b>Office Hours</b>	<b>Office Hours</b>	<b>Office Hours</b>	<b>Office Hours</b>
<b>12:00-12:50</b>	<b>Astro Lab Set-up</b>	<b>PS Lab</b>		<b>PS Lab</b>	<b>Faculty Meeting</b>
<b>1:00-1:50</b>	<b>Descriptive Astronomy</b>	<b>PS Lab</b>	<b>Descriptive Astronomy</b>	<b>PS Lab</b>	<b>Descriptive Astronomy</b>
<b>2:00-2:50</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>PS Lab Set-up</b>
<b>3:00-3:50</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>Astro. Lab</b>	<b>PS Lab Set-up</b>