

# General Physics with Calculus Part II, PH 212 Syllabus

## General Information

### Instructor Information and Availability

Instructor name: Heather Hill

E-mail address: hillh@linnbenton.edu

Office hours: Monday 3 – 5pm, Tuesday 12 – 2pm, Thursday 1 – 2pm, Friday 1 – 2pm  
(or available by appointment)

Office number: MH 111

### Course Information

CRN: 33397; Section: 09

5pm – 7pm on MW, 5pm – 8pm on R

Classrooms: MH 106, MH 114

Number of credits: 4

CRN: 33763; Section: 13

2pm – 4pm TR, 2pm – 5pm W

Classrooms: MH 113, MH 114

Number of credits: 4

### Prerequisites:

MTH 252 and PH 211 with a grade of "C" or better.

**Important Note for Next Term:** If you plan on taking PH 213 in the Spring, you need to complete MTH 254 this term.

### Course Description

Welcome to PH 212! As you discovered in PH 212, physics is the study of nature. Last term, we spent time discovering how objects moved and how we used quantities such as Forces, Energy and Momentum to discuss the motion of objects along and as they interacted together.

This term we will build upon our knowledge of how objects behave and interact by exploring other common situations we find in nature. We will start by investigating how planets, stars, and moons (and you!!) orbit around each other. This will lead into a discussion of rotational motion. Up until this point, we have mostly limited ourselves to solid objects, so it will be worth looking at fluids like water that we find everywhere in everyday life. We will then discover that many (actually all!) things around you vibrate in a very similar way. This will lead naturally into an exploration of sound and light. This final step will let us build a telescope that we can observe the planets and stars with which this term started!

This term will be a lot like last term in that the class will have homework assignments through [masteringphysics.com](http://masteringphysics.com), two exams and a final, and a set of laboratory activities. A new addition this term is that you, in a group of size one, two, or three, will choose a topic upon which to do a little extra research and make a presentation upon what you learned.

There are a set of outcomes for PH 211 and PH 212 that have been developed by committees formed from industry executives, researchers, and physicists. These outcomes specify the skills and abilities a student successfully completing PH 212 will have. By the end of PH 212...

- You will have a better understanding of nature and the physical universe.
- You will be able to solve problems graphically and mathematically using the full tools available by a knowledge of first-year calculus.
- You will be able to collect data using a variety of tools.
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- You will be able to accurately record and analyze data using a variety of methods.
- You will be able to present and analyze theories, ideas and conclusions.
- You will have mastered and related the above outcomes to the topics and concepts specific to this course.

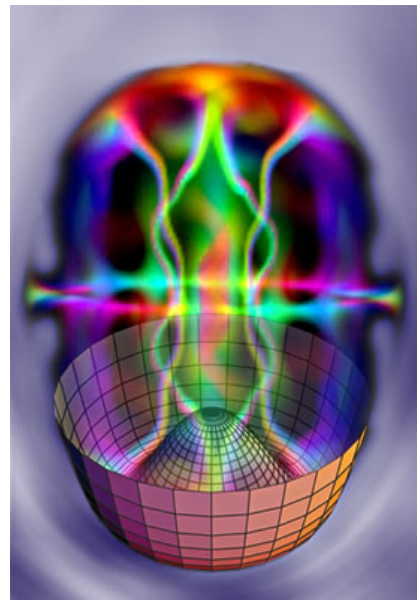
Whether you are an engineer, scientist, mathematician or a citizen of our world, we expect that the tools you gain in this class, as well as all the classes that you take, will allow you to understand in a more complete manner the way the world works and how you can improve the quality of life upon it.

Meanwhile, as always the most important reason to study physics is because it is simply fun. Studying the nuts and bolts of physics takes a lot of work. But it is these nuts and bolts that come together to form a bigger picture of how the universe works and with this a better understanding of the possibilities it affords us.

My favorite topics within physics are acoustics, biophysics (breast cancer cell research), physics education research (PER) and historical physics. You can ask me about Schrödinger's cat, the Michelson Interferometer and the luminiferous æther, marimba resonator and bar construction, microtumors or spheroids, single photon confocal microscopy and multiphoton microscopy.

### Grading:

Midterm Exams:	35%
Final Exam:	20%
Labs:	15%
Hand-In HW:	13%
Mastering HW:	10%
Project:	5%
PRS:	2%



*Physics is the study of the underlying forces of nature and the search for the understanding of the fundamental building blocks of the universe.*

## Grades:

A	100 – 90%
B	89 – 80%
C	79 – 70%
D	69 – 60%
F	59 – 0%

## Other possible grades at LBCC:

**I -- Incomplete.** An 'I' grade is assigned if for some reason a student cannot complete all components of the course by the end of the academic term. To receive an 'I' grade, the instructor and student must agree upon a contract that will spell out when uncompleted work will be turned in. The student has until the end of the following quarter to complete all unfinished work.

**W – Withdraw.** A 'W' grade is given if the student withdraws from the class through the Registrar. W's do not impact GPA, but may impact completion scores for financial aid and other purposes. Look in webrunner for the last day to withdraw from classes and other details.

**Exams:** There will be two midterms and a final exam this term. The final will consist of a conceptual part and an analytical part. The conceptual part will consist of 20 – 25 questions that will be either from the “Stop and Thinks” in the book or from the conceptual questions included at the end of each chapter. There is the option of a take-home final exam that we will discuss in class.

**Labs:** Laboratory work is a large part of the grade. Lab manuals are available in the campus bookstore as are the required lab notebooks. A significant part of each exam will consist of topics covered in the lab. **No lab scores will be dropped. However, you can make up one lab or improve one low score via the make-up lab assignment.**

**Lab Project:** You will choose a topic to research and will present your topic to a group of experts and/or the general public. A list of possible projects will be passed out during the first week of classes. Presentation dates vary depending upon the project – poster deadlines are Week 8 and Week 9.

**Homework:** Homework comes from the end of the chapters in our textbook and are to be completed online at [masteringphysics.com](http://masteringphysics.com). Access to this website comes with your textbook. The course code this term is: **PH212Winter2019**

**Hand-In Problems (HIPs):** HIPs will be posted on Moodle and at [minirov.info/ph212](http://minirov.info/ph212). Your ability to communicate your problem-solving skills is just as important as your ability to come up with a correct answer. Thus, you should neatly and clearly show all of your work for each HIP. Pay attention to each category in the scoring rubric that you turn in each week with your HIP. HIPs will be turn in via DropBox. Check the course website for full instructions on how to turn in HIPs.

## Late Assignment Policy

No work can be made up after it is returned to the class. Late homework is not accepted.

# **College Policies**

## **LBCC Email and Course Communications**

You are responsible for all communications sent via Moodle and to your LBCC email account. You are required to use your LBCC provided email account for all email communications at the College.

## **Disability and Access Statement**

LBCC is committed to inclusiveness and equal access to higher education. If you have approved accommodations through the Center for Accessibility Resources (CFAR) and would like to use your accommodations in this class, please talk to your instructor as soon as possible to discuss your needs. If you believe you may need accommodation but are not yet registered with CFAR, please visit the CFAR website at [www.linnbenton.edu/cfar](http://www.linnbenton.edu/cfar) for steps on how to apply for services or call 541-917-4789.

## **Statement of Inclusion**

To promote academic excellence and learning environments that encourage multiple perspectives and the free exchange of ideas, all courses at LBCC will provide students the opportunity to interact with values, opinions, and/or beliefs different than their own in safe, positive and nurturing learning environments. LBCC is committed to producing culturally literate individuals capable of interacting, collaborating and problem-solving in an ever-changing community and diverse workforce.

## **Title IX Reporting Policy**

If you or another student are the victim of any form of sexual misconduct (including dating/domestic violence, stalking, sexual harassment), or any form of gender discrimination, LBCC can assist you. You can [report](#) a violation of our sexual misconduct policy directly to our Title IX Coordinator. You may also report the issue to a faculty member, who is required to notify the Coordinator, or you may make an appointment to speak confidentially to our Advising and Career Center by calling 541-917-4780.

## **Campus Police/Emergency Resources**

You may review emergency services and resources at the LBCC [Public Safety website](#). Campus Safety can be reached using the 'Code 2' button on any campus phone or by dialing x411 on campus or (541) 917-4440 off campus. Dial 911 for off campus emergencies.

## **Campus Resources**

### **Learning Center**

The Learning Center provides academic support and a comfortable place to study. It is located on the second floor above the Library. It also provides free tutoring services for all classes.

### **Library**

Computers and printing available.

### **Science Help Desk**

The Science Help Desk is located in the atrium on the first floor of Madrone Hall and is manned 20 hours per week.

### **Single Stop**

Any student who has difficulty affording groceries or accessing sufficient food to eat every day, or who lacks a safe and stable place to live, and believes this may affect their performance in the course, is urged to contact the Single Stop Office for support ([singlestopatLBCC@linnbenton.edu](mailto:singlestopatLBCC@linnbenton.edu), 541-917-4877, or visit the website <https://www.linnbenton.edu/current-students/student-support/Single-Stop-at-LBCC/>). The office can help students get connected to resources to help. Furthermore, please notify me if you are comfortable in doing so. This will enable me to provide any resources, knowledge or connections that I may possess to help aid.

### **Linn-Benton Lunch Box**

The LB Lunch Box provides an emergency supply of food for students in need. <https://www.linnbenton.edu/current-students/involvement/institutional-equity-and-student-engagement/student-resources/lb-lunch-box.php>

## **Changes to the Syllabus**

I reserve the right to change the contents of this syllabus due to unforeseen circumstances. You will be given notice of relevant changes in class, through a Moodle Announcement, or through LBCC e-mail.

**Science Help Desk Schedule for Winter 2019**  
 (First Floor of Madrone Hall)  
*January. 7 – March. 15*

TIME	MON.	TUE.	WED.
8:00			
9:00	ERIC Chemistry, Physics (9 – 11 am)		
10:00		ERIC Chemistry, Physics (10 am – 12 pm)	
11:00			
12:00	AARON Chemistry (12 – 4 pm)		WILLIAM Physics (11:30 am – 2:30 pm)
1:00		WILLIAM Physics (11:30 am – 2:30 pm)	
2:00		ERIC Chemistry, Physics (1 – 3 pm)	
3:00			RUSSELL Physics, Chemistry, Geology (2 – 5 pm)
4:00	MISA Physics, Astronomy, Geology (4 – 5 pm)	MISA Physics, Astronomy, Geology (3 – 5 pm)	
5:00			

## PH 212 Tentative Schedule

Week	Monday	Tuesday	Wednesday	W/R Lab	Friday
<b>1</b>	Jan 7th <b>Intro Chapter 13</b>	Jan 8th	Jan 9th <b>Chapter 13</b>	<b>Lab 3: Universal Gravitation</b>	Jan 11th  <b>HW 1a Due</b>
<b>2</b>	Jan 14th <b>Chapter 13 Chapter 12.1 - 12.3</b>	Jan 15th  <b>HW 1b Due</b>	Jan 16th <b>Chapter 12.5 - 12.8</b>  <b>HIP 1 Due</b>	<b>Lab 2: Torques and Angular Accel</b>	Jan 18th  <b>HW 2a Due</b>
<b>3</b>	Jan 21st <b>MLK Day No Class</b>	Jan 22nd  <b>HW 2b Due</b>	Jan 23rd <b>Chapter 12.4</b>  <b>HIP 2 Due</b>	<b>Center of Mass Lab</b>	Jan 25th  <b>HW 3a Due</b>
<b>4</b>	Jan 28th <b>Chapter 14</b>  <b>HW 3b Due</b>	Jan 29th  <b>HIP 3 Due</b>	Jan 30th <b>Chapter 14</b>	<b>Lab 5: Archimedes' Principle</b>	Feb 1st  <b>HW 4a Due</b>
<b>5</b>	Feb 4th <b>Exam I</b>  <b>HIP 4 Due/HW 4b Due</b>	Feb 5th	Feb 6th <b>Chapter 15</b>	<b>Lab 4: Simple Harmonic Motion</b>	Feb 8th  <b>HW 5a Due</b>
<b>6</b>	Feb 11th <b>Chapter 15</b>  <b>HW 5b Due</b>	Feb 12th  <b>HIP 5 Due</b>	Feb 13th <b>Chapters 16</b>	<b>Lab 6: Doppler Effect</b>	Feb 15th  <b>HW 6a Due</b>
<b>7</b>	Feb 18th <b>Presidents' Day No Class</b>	Feb 19th  <b>HIP 6 Due/HW 6b Due</b>	Feb 20th <b>Chapter 17</b>	<b>Lab 7: Standing Waves</b>	Feb 22nd  <b>HW 7a Due</b>
<b>8</b>	Feb 25th <b>Exam 2</b>  <b>HW 7b Due/HIP 7 Due</b>	Feb 26th	Feb 27th <b>Chapter 33</b>	<b>Lab 8: Diffraction</b>	March 1st  <b>HW 8a Due</b>
<b>9</b>	March 4th <b>Chapter 33</b>  <b>HW 8b Due</b>	March 5th  <b>HIP 8 Due</b>	March 6th <b>Old Chapter 25 Handout</b>	<b>Project Evaluation</b>	March 8th  <b>HW 9a Due</b>
<b>10</b>	March 11th <b>Chapter 34</b>  <b>HW 9b Due</b>	March 12th  <b>HIP 9 Due</b>	March 13th <b>Old Chapter 35 Handout</b>  <b>HIP 10 Due</b>	<b>Lab 9: Telescopes</b>	March 15th  <b>HW 10 Due/EC HW</b>
<b>11</b>	March 18th <b>M/W Final Exam 5pm - 6:50pm MH 106</b>	March 19th	March 20th		March 22nd