

<b>Monday</b>	<b>T/W Lab</b>	<b>Wednesday</b>	<b>Friday</b>
<b>8.Jan</b> Introduction Sect. 1.1-1.5	<b>Lab #1</b> x,v,a and all-that	<b>10.Jan</b> Sect. 1.6-1.9 Sect. 2.1-2.5 <b>HW#0 Due</b>	<b>12.Jan</b> <b>HW#1a Due</b>
<b>15.Jan</b> MLK Day College Closed	<b>Lab #2</b> Accel. due to Gravity <b>HW#1b Due</b>	<b>17.Jan</b> Sect. 2.6-2.7 Sect. 3.1-3.4 HIP1	<b>19.Jan</b> <b>HW#2a Due</b>
<b>22.Jan</b> Sect. 4.1-4.5 <b>HW#2b Due</b>	<b>Lab #3</b> 2-D Motion	<b>24.Jan</b> Sect. 4.6-4.7 Chapter 1-4 Review HIP2	<b>26.Jan</b> <b>HW#3 Due</b>
<b>29.Jan</b> <b>Exam 1</b>	<b>Lab #4</b> Forces	<b>31.Jan</b> Sect. 5.1-5.7 HIP3	<b>2.Feb</b> <b>HW#4a Due</b>
<b>5.Feb</b> Sect. 6.1-6.4 <b>HW#4b Due</b>	<b>Lab #5</b> Forces, Accel., & Friction	<b>7.Feb</b> Sect. 6.5-6.6 Sect. 7.1-7.2 HIP4	<b>9.Feb</b> <b>HW#5a Due</b>
<b>12.Feb</b> Sect. 7.3-7.5 Sect. 8.1-8.2 <b>HW#5b Due</b>	<b>Lab #6</b> Centripetal Motion	<b>14.Feb</b> Sect. 8.3-8.5 Sect. 9.1-9.3 HIP5	<b>16.Feb</b> <b>HW#6a Due</b>
<b>19.Feb</b> President's Day College Closed	<b>Lab #8</b> Conserv. Of Energy <b>HW#6b Due</b>	<b>21.Feb</b> Sect. 9.4-9.6 Chapter 5-9 Review HIP6	<b>23.Feb</b> <b>HW#7 Due</b>
<b>26.Feb</b> <b>Exam 2</b>	<b>Lab #9</b> Global E-Budget	<b>31.Feb</b> Sect. 10.1-10.5 HIP7	<b>2.Mar</b> <b>HW#8a Due</b>
<b>5.Mar</b> Sect. 10.6-10.8 Sect. 11.1-11.3 <b>HW#8b Due</b>	<b>Lab #10</b> Energy, Momentum, Friction and More	<b>7.Mar</b> Sect. 11.4-11.5 HIP8	<b>9.Mar</b> <b>HW#9a Due</b>
<b>12.Mar</b> Chapter 10-11 Review <b>HW#9b Due</b>	<b>Lab #11</b> Explosions, Impulse, and Makeup	<b>14.Mar</b> Chapter 1-11 Review HIP9+HIP10	<b>16.Mar</b> EC Assignment Due

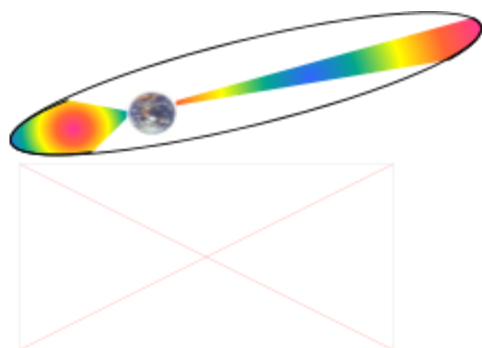
<i>19 Mar</i> Final: 5-6:50pm	<i>23 Mar</i>	<i>21 Mar</i>	<i>23 Mar</i>
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# *PH 211*

## General Physics with Calculus

**Lecture:** MW 5pm MH113

**Lab:** Tues/Wed MH114



**Instructor:**

Evan Thatcher

**Office:** MH 111

**Phone:** 541-917-4234

**E-mail:** [thatche@linnbenton.edu](mailto:thatche@linnbenton.edu)

**Office Hours:**

M 4-4:50pm

W 1-1:50pm

Or by Appointment

Or call or e-mail at any time!

**Textbook:** "Physics for Scientists and Engineers: A Strategic Approach" 4<sup>th</sup> Edition

**Online Homework assigned at:**

[www.masteringphysics.com](http://www.masteringphysics.com)

Course Code:

PH211WINTER2018

**Class material available at:**

<http://clearning.linnbenton.edu>

**Linn-Benton Community  
College  
Winter 2018**

*Ph 211:*  
*General Physics with Calculus*

# P

Physics is the study of nature. It is the study of how rainbows are formed. It is the study of why the sky is blue, why the stars twinkle, and how the planets move through the heavens.

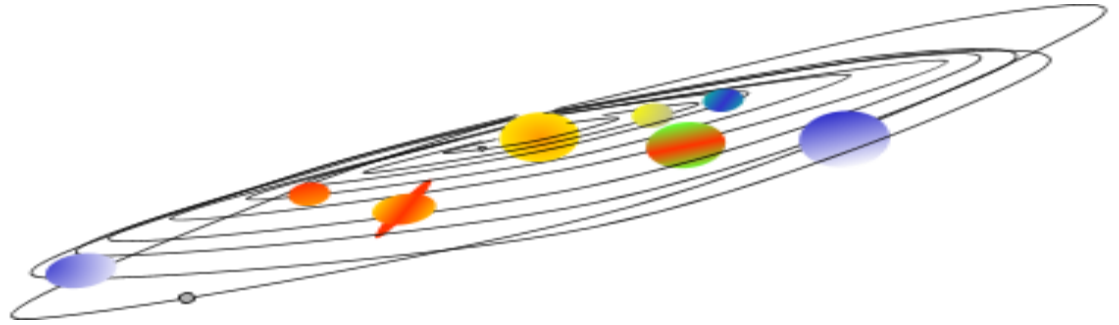
Applications of physics have given us eye glasses, levers, pulleys, the combustion engine, transatlantic steamers and communication, television, lasers, computers, satellites, space flight, and new insights into the universe that startle the imagination and can only make one hungry to learn more.

When developing the Ph 211 sequence we invited a variety individuals from industry and academia to help determine what skills and knowledge you should gain during your year of Physics with Calculus in order to maximize your potential in your future career.

As you complete this sequence of courses you should:

- have a better understanding of nature and the physical universe.
- be able to solve problems graphically, mathematically, and computationally using the full tools available by a knowledge of first-year calculus
- be able to collect data using a variety of tools.

- be able to



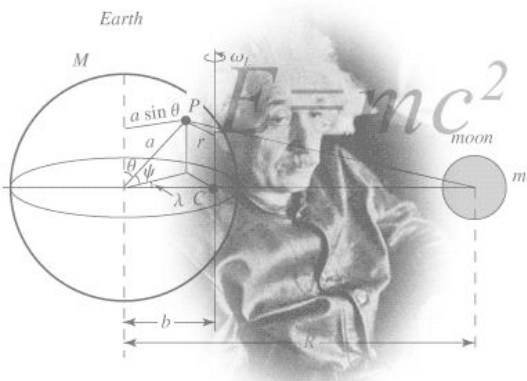
accurately record and analyze data using a variety of methods.

- be able to present and analyze theories, ideas and conclusions.
- master and relate the above outcomes to the topics and concepts specific to this course.

Of course, to me, the most important reason to study physics is because it is simply fun. Physicists have the neatest toys—many of which I hope to share with you—and we get to go on gedanken journeys that previous generations can't even imagine.

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

In Physics 211 we will study the foundations of physics. We will discover how a guy named Aristotle had ideas that seemed good at the time but ended up goofing up Western Civilization's view of the Universe for the better part of two millennia. In this adventure we will start by making everyday observations about how things move—by the end of the term we will end up learning some pretty neat things about universal law of gravitation and the shape of the universe in which live.



As you continue on in Physics, in Physics 212 we get to deal about fluids, pressure, waves, light and sound. Physics 213 focuses on electric charges and field, the origins of magnetism, and the fundamental origins of the formation of light. In Physics 314 we get to learn about the shape of space, the nature of time, the unpredictable but very probable nature of the universe and the fundamental interconnectedness of everything.



**Math requirements for this class and for physics in general**

Math is the language of a large part of what we do in physics. To be able to do well in Physics, we've created the following prerequisites for this class:

- Completion of MTH 251 (Differential Calculus) with a "C" grade or better.
- Completion of MTH 252 (Integral Calculus) with a "C" grade or better.

Physics is a field that heavily relies upon mathematics. This is because mathematics is a compact language that allows physicists to speak to one another regardless of what part of the world they might come from. An added benefit of this class is that you will leave it with a greater understanding of just what all that math you've been studying is about.

## Grading Scale for this course:

Basis for grading:		Grading Scale:	
Midterm Exams:	30%	90%-100%	A
Final Exam	25%	80%-89%	B
Labs:	15%	70%-79%	C
Hand-In Problem	15%	60%-69%	D
MP Homework:	10%	< 60%	F
Participation	5%		

Final grades

### 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 next term to complete all unfinished work

**Y -- No basis for grade.** A 'Y' grade is given if there is not enough completed work for the instructor to assign a grade. Generally, a 'Y' grade cannot be assigned to a student who has completed more than the first three weeks of class.

are determined from the below components of the course.

If you don't know how to calculate a weighted grade, there is a spreadsheet program available on Moodle that will help you, or use the formula:

$$FinalGrade = \sum_i (percent\_weight) \cdot \frac{pts\_earned\_per\_category}{total\_pts\_possible\_per\_category}$$

**Exams:** There will be two mid-term exams and one final exam for the term. One aspect of physics is that every week will build upon what was learned in the weeks previously. As a consequence, by nature, the each exam will be comprehensive. A large fraction of the Final will come directly from the conceptual questions that will be given to the class in the textbook and on Moodle.

**Labs:** Much of the learning that goes on in physics happens in the lab. Laboratory work is consequently a large part of the grade. A significant part of each exam will consist of topics covered in the lab.

**Ph 265:** There are three main ways of solving physics problems: analytically, computationally and empirically. Nearly every week a computational physics assignment will be due in lab and/or homework. VPython is the programming language we will be using. VPython allows for easy 3D visualization of physical situations and Python is a common modern programming language. *No prior computer programming experience is required* as the learning curve for VPython is pretty quick.

**Homework** assignments come from the end of the chapters in our text book and are to be completed online at [www.masteringphysics.com](http://www.masteringphysics.com). Access to this website comes with your textbook and you will need to enter **PH211WINTER2018** as the Course ID. Homework solutions and other materials are available at <http://elearning.linnbenton.edu>. Make sure that your current e-mail is listed at both sites so that you can receive e-mailed course information.

**Hand-In Problem:** Almost every week a homework problem will be due that is to be turned in in hard-copy format. The Hand-In Problem's purpose is to allow you to receive feedback on how you present your work.

**Project Development:** In Ph212 you will be asked to complete a capstone physics project where you design, construct, run and present an experiment. The Project Development assignments this term will be a set of exercises to assist you in your capstone project for next term. The average time commitment to this assignment should be around 25 minutes a week.

**Participation** During the first week of classes you will be assigned a "Personal Response System" (PRS) unit (also known as a "clicker"). Make sure that you pick up your PRS unit each day at the beginning of class and make sure that you return it at the end of class. Participation points come from entering an answer for each PRS question – it doesn't matter whether or not you answer correctly, you just need to make sure that you submit an answer each time to receive participation points.

**Students in need of accommodations:** Students who may need accommodations due to documented disabilities, or who have medical information which the instructor should know, or who need special arrangements in an emergency, should speak with the instructor during the first week of class. If you believe you may need accommodations, but are not yet registered with CFAR, please go to <http://linnbenton.edu/cfar> for steps on how to apply for services or call 541-917- 4789.

**Other important information:** The Add/Drop date and date for payment has moved to the 2<sup>nd</sup> Monday of the term. The good news is that this change allows for financial aid to be disbursed a week earlier than in the past.

Use this sheet to keep track of your overall score in the class. You can use this formula to find your total weighted grade or use the grade calculator on Moodle.

$$FinalGrade = \sum_i (percent\_weight) \cdot \frac{pts\_earned\_per\_catagory}{total\_pts\_possible\_per\_catatory}$$

**Homework 10%:**

	Your Score	Out Of
HW0E C		
HW1		
HW2		
HW3		
HW4		
HW5		
HW6		
HW7		
HW8		
HW9		
ECHW		

Lab1		10
Lab2		10
Lab3		10
Lab4		10
Lab5		10
Lab6		10
Lab8		10
Lab9		10
Lab10		10
MakeU p		10

**Hand-In-Problems: 15%**

	Your Score	Out Of
HIP1		10
HIP2		10
HIP3		10
HIP4		10
HIP5		10
HIP6		10
HIP7		10
HIP8		10
HIP9		10
HIP10 Term Summary		10

**Midterms and Final: 55%**

	Your Score	Out Of
Exam 1		50
Exam 2		50
Final		100

**Participation: 5%**

	M	W
Week 1		
Week 2		
Week 3		
Week 4		
Week 5		
Week 6		
Week 7		
Week 8		
Week 9		
Week 10		

**Labs: 15%**

	WriteU p	Out Of
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