

Syllabus PH 211: General Physics with Calculus I

Linn Benton Community College: Fall 2017, 5 c.h.
CRN 26104, 26110, 26114

Instructor: Ralph Tadday, Ph.D., taddayr@linnbenton.edu, MH-112, (541) 917-4743

Office Hours: MW 11am – 12pm, and 4pm-5pm
T 9am – 11pm

When and where this course meets:

Lecture: MTWF 8:00 am – 8:50 am, MH 113 (CRN 26104, 26110, 26114)

Laboratory: W 5:00 pm – 7:50 pm, MH 114 (CRN 26114)

R 8:00 am – 10:50 am, MH 114 (CRN 26104)

R 11:00 am – 1:50 pm, MH 114 (CRN 26110)

Final: Wednesday, December 6, 8:00 am - 9:50 am

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. As an added benefit of this class you will leave it with a greater understanding of just what all that math you've been studying is about.

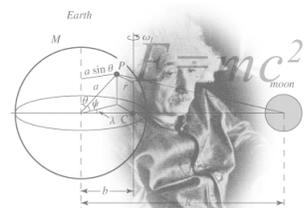
Required Materials:

Text book and Workbook: 'Physics For Scientists and Engineers: A Strategic Approach' 4/E, by Randall D. Knight. If you decided to also get the workbook accompanying this book, you ideally do the exercises before you start the homework on mastering physics for each chapter. We will use some of the exercises in class. The text and Mastering Physics will also be used in PH212 and PH213.

PH 211 Lab Manual available in the LBCC bookstore, and a Laboratory notebook (Computation Notebook)

Mastering Physics subscriptions: New purchases of the text come with an option for an access code to subscribe to the *masteringphysics.com* website, which is required. Subscriptions last for 2 years from the date of activation so if you already have a current subscription you do not need to purchase the text with the access code. If you buy a used text you can purchase an access code through the M.P. website. Select the text ***Knight, Physics for Scientists & Engineers with Modern Physics, 4e*** when registering with M.P. The course name is **PH211FALL2017**.

Course Information Online: You will find course materials for our class on the 'Moodle' website at elearning.linnbenton.edu, entitled "PH211 General Physics w/ Calculus (PH211_GR)". Please check the Moodle page regularly.



Contacting me: The best way to contact me is in person during office hours or via email. Also, usually whenever you see me, I am happy to talk to you. I would recommend you to see me at least 3 times this term, one in the first three weeks, once in the middle of the term, and once towards the end of the term.

Office hours: It has been shown that success of students correlates to the time they spend with their professor. I will therefore invite you to come and see me at office hours. Ideally I see you at least three times to office hours, one time within the first 3 weeks, one time during weeks 4-6, and one more time between weeks 7-9. I hope you will show up with a smile on your face, and have some questions and feedback for me - no matter what we will talking about, I am looking forward to talking with you.

Resources: The **Science Help Desk** in the atrium of Madrone Hall is open for several hours each week, where you can drop in for homework help. Also, you can sign up for Math and Physics tutoring in the **Learning Resource Center**. One of the best resources I found are your fellow students in your class. Study together, ask each other questions, answer questions, dig in, have fun with it, be persistent, and find me before you develop the desire to throw you physics book out of the window.

Class time will be spent on a variety of activities, including group work, discussions, lectures, problem-solving sessions, and demonstrations. I constantly work on making our classroom an interactive classroom for all of us. I rely on you to create that learning environment. It will benefit you to participate enthusiastically, which will also make it more fun for all of us. Unless you make special arrangements with me, I expect your **cell phone or PDA will be turned off during class.**

Cheating: I do not tolerate cheats: I give zeros and will report incidents to the college administration. Remember that representing another's words or ideas as your own is plagiarism. If you are making use of the work of others, cite the source. If you have questions about what does and does not constitute cheating, talk to me *before you turn the questionable work in.*

Students in need of accommodations: Students who may need accommodations due to documented disabilities, 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 have not accessed services and think you may need them, please contact Disability Services, 917-4789.

LBCC Nondiscrimination Statement: LBCC prohibits unlawful discrimination based on race, color, religion, ethnicity, use of native language, national origin, sex, sexual orientation, marital status, disability, veteran status, age, or any other status protected under applicable federal, state, or local laws.

Other important information: The Add/Drop date and date for payment is the 2nd Monday of the term. This allows for financial aid to be disbursed a week earlier than in the not too distant past.

Calculator Policy: Students will be required to use a non-graphing/non-programmable scientific calculator for quizzes and/or exams. Department approved calculators are: TI 30xa, TI 30X IIs, Casio fx-260, or HP 10s. If a student does not wish to purchase one of these calculators the department will provide either a Casio fx-260, or HP 10s for use on exams and/or quizzes.

Grading Scale for this course:

Final grades are determined from the below components of the course:

Basis for grading:		Grading Scale:	Other possible grades at LBCC:	
Midterm Exams:	30%	90%-100%	A	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
Final Exam	20%	80%-89%	B	
Labs:	15%	70%-79%	C	
MP Homework:	10%	60%-69%	D	
Hand-in HW:	10%	< 60%	F	
Enhancement	5%			
Reading Quizzes	5%			
Journal	5%			

If you need help calculating a weighted grade, there is a spreadsheet program available on Moodle that will support you, or use the formula:

$$FinalGrade = \sum_i (percent_weight) \cdot \frac{pts_earned_per_category}{total_pts_possible_per_category}$$

Exams: There will two exams and one comprehensive final exam for the term.

The Final: One aspect of physics is that every week builds upon what was learned in the weeks previously. As a consequence, by nature, the final exam is comprehensive. A large fraction of the Final will consist of conceptual questions similar to the questions discussed in class, and the conceptual questions at the end of each chapter in the textbook. Do all of them.

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. Prelab and Postlab exercises support your learning in the laboratory environment. Each lab report includes a summary you write that summarizes shortly what you did in the lab, and what you learned or missed.

Homework (HW) assignments from the end of the chapters in our text book and are to be completed online at www.masteringphysics.com. Website access comes with your textbook. Enter **PH211FALL2017** as the Course ID. HW support is available at the Moodle page for this class. Make sure that your current e-mail is listed at both sites so that you can receive e-mailed course information.

Hand-In Problem (HIP): Every week a homework problem will be due to be turned in in hard-copy format. The HIP's purpose is to insure you receiving instructor feedback on your work.

Hand-In Problem Enhancement: You will have the opportunity to develop your problem solving skills using your own applied physics problem based on the Hand-In Problem and your own life and interest.

Reading Quizzes: We will write regular very short reading quizzes at the beginning of class. The questions will be about the sections in the textbook listed in the class schedule shown in this document.

Journal: Each week you will write one page summarizing your learning and struggles and hand it in on Fridays for review. You are free in your choice of material. We would also accept a YouTube video or another form of your expression. You might choose to include a key picture, a diagram or graph and a related equation. I am curious what I get.

Objectives:

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. This first term of the sequence we will focus on mechanical forces and how they might result in motion.

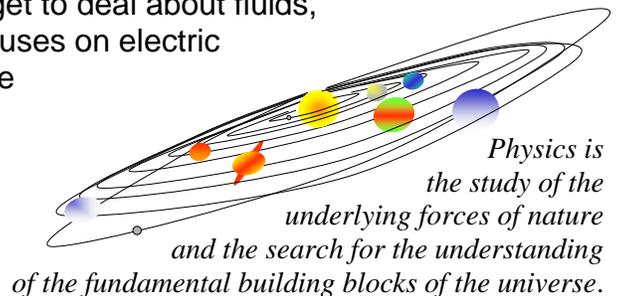
When developing the PH211 sequence we invited people from industry and academia to help determine what skills and knowledge you should gain during your year of Physics in order to maximize your potential in your future career.

These discussions resulted in the following **course outcomes**:

Upon successful completion of this course students will be able to:

- Describe and explain physical objects in motion.
- Conduct experiments to determine critical motion parameters (such as position, velocity, acceleration, and forces).
- Use calculus to solve motion problems with non-constant acceleration.
- Solve physics problems involving forces, momentum and energy.
- Select between force and conservation concepts (energy or momentum) to solve Newtonian mechanics problems.

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 light. If you continue the fundamental study of nature, in Physics 314 you get to learn about the shape and nature of space and time, the unpredictable but very probable nature of the universe and interconnectedness of everything.



Suggestions for success:

Physics can be both challenging and rewarding. In order to succeed, plan to:

- Arrive at class on time, prepared to participate, contribute to discussions, and treat your classmates with respect.
- Check our Moodle page regularly, and stay aware of current assignments.
- Complete readings before class, and review your class notes later the same day.
- Work through the conceptual problems at the end of each chapter and the accompanying workbook before you start doing the Mastering Physics HW.
- Start HW the day it is assigned, and break the work into small pieces. Your understanding will be much greater if you complete homework on a daily basis.
- Find help when you have not successfully answered a question in the first or second try. Do not fall into try and error.
- Do additional practice homework problems in any areas where you are not satisfied with your understanding.
- Work responsibly with other students in and out of class.
- Seek help whenever you realize you are struggling.

I am constantly striving to become a better teacher, and find ways to support you better in your learning. Therefore this document is subject to change.

PH211 FA2017, LBCC, Schedule Ralph Tadday (subject to change):

Week	Key Topics Reading (see Moodle) MP due Sunday Night	Monday Labbook due in Lecture	Tuesday	Wednesday	W/Th Lab	Friday
1	Introduction, Physics, Motion Diagrams, Particle Model, Position, Displacement, Speed, Velocity, Acceleration, Vector, Sig Figs	25. Sept Introduction	26. Sept <i>Reading</i> Sect. 1.1-1.5 Reading1 Due HW#0 Due	27. Sept Sect. 1.6-1.8 Syllabus Comp. & Refl. Due HW#1a Due	Lab #1 x,v,a and all-that	29. Sept Sect. 2.1-2.2 Journal 1
2	1D- kinematics, Instantaneous and average velocity and acceleration including plots, Free Fall	2. Oct Sect. 2.3-2.4 HW#1b Due	3. Oct Sect. 2.5-2.6 HIP1 Due	4. Oct Sect. 2.7	Lab #2 Accel. due to Gravity	6. Oct Sect. 3.1-3.2 Journal 2
3	More Vectors, 2D kinematics, Projectile Motion, Uniform Circular Motion	9. Oct Sec. 3.3-3.4 HW#2 Due	10. Oct Sect. 4.1-4.3 HIP2 Due	11. Oct Sect. 4.4-4.5	Lab #3 2-D Motion	13. Oct Sect. 4.6 Journal 3
4	Review Kinematics, Forces, Identifying Forces, Newtons 2 nd Law intro	16. Oct Review Chapter 1-4 HW#3 Due	17. Oct Exam 1 HIP3 Due	18. Oct Sect 5.1-5.2	Lab #4 Forces in Equilibrium	20. Oct Sect. 5.3-5.5 Journal 4
5	Free Body Diagrams, Newton's 1 st Law, Use Newton's 2 nd Law, Friction, Drag	23. Oct Sect. 5.6-5.7 HW#4 Due	24. Oct Sect. 6.1-6.3 HIP4 Due	25. Oct Sect. 6.4-6.5	Lab #5 Forces, Accel., & Friction	27. Oct Sect. 6.6 Journal 5
6	Newton's 3 rd law, Interacting objects, Ropes and Pulleys, Uniform & Nonuniform Circular Motion	30. Oct Sect. 7.1-7.2 HW#5 Due	31. Oct Sect 7.3-7.5 HIP5 Due	1. Nov Sect. 8.1-8.3	Lab #6 Centripetal Motion	3. Nov Chp 8.4-8.5 Journal 6
7	Energy, Work-Energy theorem, Calculating Work done, Thermal Energy, Power	6. Nov Sect. 9.1-9.3 (Chp 10 in 3 rd ed.) HW#6 Due	7. Nov Sect. 9.4-9.6 HIP6 Due	8. Nov Review Chapter 9 Journal 7	Lab #7 Conserv. Of Energy	10. Nov <i>Veterans' Day</i> <i>LBCC Closed</i>
8	Potential Energy, Conservation of Energy, Energy Diagrams,	13. Nov Review Chapter 5-9 HW#7 Due	14. Nov Exam 2 HIP7 Due	15. Nov Sect. 10.1-10.3 (Chp 11 in 3 rd ed.)	Lab #8 Global E-Budget	17. Nov Sect. 10.4-10.5 Journal 8
9	Force and Potential Energy, Impulse & Momentum, Conservation of Momentum, Collisions (Inelastic and Elastic)	20. Nov Sect. 10.6-10.8 HW#8 Due	21. Nov Sect. 11.1-11.2 (Ch9 in 3 rd) HIP8 Due	22. Nov Sect. 11.3 Journal 9	<i>Happy Thanks-giving</i>	24. Nov <i>LBCC Closed</i>
10	Explosions, Momentum in 2D, Review	27. Nov Sect. 11.4 HW#9 Due	28. Nov Sect 11.5-11.6 HIP9+10 Due	29. Nov Review Chapter 11	Lab #10 Energy, Momentum, Friction and More	1. Dec Review All HW#10 Due ECHW Due
11		4. Dec Alternative Final 10-11:50am		6. Dec Final 8-9:50am		

For Mastering Physics homework please also refer to the schedule given at the Mastering Physics website

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.

$$FinalGrade = \sum_i (percent_weight) \bullet \frac{pts_earned_per_catagory}{total_pts_possible_per_catagory}$$

MP Reading&Homework: 10%

	Your Score	Out Of
HW0EC		
HW1		
HW2		
HW3		
HW4		
HW5		
HW6		
HW7		
HW8		
HW9		
ECHW		

Labs 15%

	Your Score	Out Of	C.P.	Out Of
Lab1		10		
Lab2		10		
Lab3		10		
Lab4		10		
Lab5		10		
Lab6		10		
Lab7		10		
Lab8		10		
Lab9		10		
MakeUp		10		

Hand-In-Problems: 10%

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

Reading Quizzes: 5%

	Your Score	Out Of

Midterms and Final: 50%

	Your Score	Out Of
Exam0		
Exam1		
Exam2		
Final		

Enhancements: 5%

	Your Score	Out Of
ENH1		10
ENH2		10
ENH3		10
ENH4		10
ENH5		10
ENH6		10
ENH7		10
ENH8		10
ENH9		10
ENH10		10

Presentation/Metacognition 5%

	Well done
Journal 1	
Journal 2	
Journal 3	
Journal 4	
Journal 5	
Journal 6	
Journal 7	
Journal 8	
Journal 9	
Journal 10	

PH211 (Ralph) Syllabus Reading Comprehension Name: _____

Class time: _____ Lab time _____

1. How often as a minimum will you see your instructor during office hours?
2. At what times/assessments are you not allowed to use a graphing calculator?
3. What are two of the outcomes of PH211 listed in the syllabus?
 - a.
 - b.
4. Of the following, what would be considered cheating? Please circle
 - a. Copying solutions into Mastering physics from some internet resource
 - b. Copying solutions into Mastering physics from a friend
 - c. Handing in a HIP you solved together with a fellow student without clearly acknowledging your fellow student.
 - d. Copying solutions to a Prelab exercise from a fellow student.
5. What do you do with your cell phone in class?
6. When do you ideally use the workbook that accompanies our textbook?

I would like to discuss the following questions/issues about the syllabus in class:

I have understood the syllabus and have listed above all questions I would like to clarify in class or during my first visit during office hours

Signature: _____

Your name and class: _____

Waitlist? Yes No

Ralph Tadday

A Little Reflection



1. Why are you here? What is your program?
2. What are your personal outcomes / expectations for this class?
Be specific! (3 minimum)
3. Help me to understand you background
What are the 3 highest level math classes you took?
4. Help us to plan this sequence:
Which physics classes do you plan to take this academic year? PH212 PH213
5. What other classes do you take this term?
6. Have you regularly scheduled time to study for this class during the week? Yes No
How many hours? _____ When? _____
7. Do you plan regularly meeting other students to study for this class? Yes No
8. Do you plan regularly coming to TASS (Tutor Assisted Study Session) for this class?
(Saturdays 1pm – 4pm) Yes No
9. Describe any foreseeable events that may hinder you to be successful in this course, or any specific requirements that may be necessary/helpful for you to perform the tasks for this class successfully. This is a good place to mention a balky car, a long commute, and/or other things that are realities for you that might impact your efforts, or anything.
10. What can I do to make this class the best class you ever had?
11. Please attach a picture of yourself to this page – thanks, it will help me learn your name!