Physics 111 – Physics I: General Physics
Course Description & Syllabus– Fall 2019

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Course Website: We will use Moodle – http://moodle.lafayette.edu. "PHYS 111.01-Fall 2019 General Physics" or "PHYS 111.02-Fall 2019 General Physics" should be in your list of current courses. The syllabus and other contents can all be accessed from this site. Announcements about class or homework logistics will be emailed to you through Moodle so make sure you are receiving emails from it.

Course Location and Times:

Class:	Hugel Science Center 100 **Section 01:** Monday, Wednesday, Friday; 11:00 AM – 11:50 AM **Section 02:** Monday, Wednesday, Friday; 1:10 PM – 2:00 PM
Office Hours:	Thursday: 4:00 – 7:00 PM

If you cannot make it to office hours, email me to set up a meeting. Please walk in with smaller questions whenever I am in my office. Always feel free to knock.

Classes on Snow Days or Other Emergencies: If I am unable to make it to class/class is cancelled or changed, I will send an email message via Moodle.

Description: This course is a non-calculus-based introduction to the foundations of physics, designed primarily for students in science who do not require a calculus-based physics course. Topics will include kinematics, dynamics, conservation laws for linear momentum, angular momentum, and energy, mechanical oscillations, and thermodynamics. Recognizing and applying physical ideas is stressed; there will also be emphasis on problem solving.

Goals & Student Learning Outcomes: The main goal of this course is to help you understand, identify, and apply the fundamental principles of physics in a variety of situations. You should be able to use both qualitative reasoning and quantitative problem-solving skills in applying those principles. A second goal is to help introduce you to the process of doing physics, including skills such as developing and testing models, interpreting experimental data, solving problems, and communicating results. Specifically, upon successful completion of this course, you should be able to

- Apply Newton's laws to analyze static and dynamic physical situations;
- Apply the laws of conservation of energy, momentum, and angular momentum to appropriate systems;
- Solve physical problems involving multiple concepts and equations;
- Describe and predict the behavior of oscillating systems; and
- Apply the three laws of thermodynamics.

In addition to the outcomes listed above, this course (particularly the lab component) will promote the following outcomes from the Natural Sciences section of the Common Course of Study:

- NS 1 Employ the fundamental elements of the scientific method in the physical and natural world.
    - NS 1a Identify and/or formulate a testable scientific hypothesis.
    - NS 1b Generate and evaluate evidence necessary to test and/or revise a hypothesis.
- NS 2 Create, interpret, and evaluate descriptions and representations of scientific data including graphs, tables, and/or models.
- NS 3 Understand how scientific uncertainty informs the evaluation of hypotheses.

Textbook: *College Physics: A Strategic Approach Technology Update,* third edition, by Randall D. Knight, Brian Jones, and Stuart Field, ISBN-13: 978-0-13-416783-1, along with its online homework component Mastering Physics. The book is an older edition (significantly cheaper than the latest one) and it is easiest to order it online. Used copies usually do not come with a key for the online component, but you can sign up for that at www.masteringphysics.com for approximately $70 (see sign up details below).

Physics 111 - Laboratory Manual is available in the bookstore.

Grade breakdown

Homework:	20%
Tests (see details below):	40%
Lab:	20%
Final exam	20%

Homework Problems: Homework problems will be a combination of **online Mastering Physics problems** and **written problems**. Your lowest homework grade will be dropped at the end of the semester. All assignments and other relevant course information will be available on Moodle. The **Mastering Physics Course IDs (and course titles)** will be announced later. You will need these IDs when you sign up.

Online homework for the week will usually be due the following week's Friday morning before class while the written one will be due in class on Wednesday.

Online homework will go up Friday late afternoon and the corresponding written part will go up on Moodle at the same time. Homework is a significant part of your grade so please make sure you do them.

Tests: There will be three hour-long in-class tests on the dates marked on the syllabus. The lowest scoring test will be worth 10% and the rest will be worth 15%. There will also be a cumulative final.

Attendance: Make sure to attend class regularly and participate in class discussions. Asking questions during class is highly encouraged, not just for your own benefit but for the benefit of your classmates. Looking over/skimming the relevant chapters from the book *before* the class lecture is highly advised. Foreknowledge of where things are going aids greatly in understanding the material.

Supplemental Instruction (details of SI sessions will be discussed in class):
SI Leader: Aditi Desai (desaia@lafayette.edu)

Ethos for grading written material: What I am looking for is your understanding of the material. If you show me your steps and thought processes clearly, and assuming those are correct, you will get most of the points. The actual final answer has minimal impact.

Academic Honesty: Discussing homework and collaborating with others is encouraged but make sure that the work you hand in is yours. Discussing concepts with others is always a great way to gain new perspectives but you must also truthfully demonstrate your own abilities. Cheating and other forms of academic dishonesty hurts no one but you in the long run.

Laboratory: You are responsible for completing all the assigned experiments at the scheduled times. **If you can't make it to your scheduled lab, please try to attend another lab session and email your lab instructor about the change (this is a last resort solution, please attend your own lab at all times)**. You can't count on the equipment being available outside of the scheduled lab times.

Diversity, Inclusion and Equity Statement: Students should view this classroom as an inclusive space and safe haven for the free exchange of ideas. As your instructor one of my primary goals is to assure that the background, perspective and beliefs of each student are respected and appreciated regardless of race, ethnicity, gender, social class, sexual orientation, religion, political affiliation, ability level or learning style. Accordingly, I am committed to creating an atmosphere conducive to learning that respects diversity and inclusion and further promotes equity by removing educational barriers. As we work together to build this community of scholars, consider the following actionable points:

- Be open to the views of others.
- Feel free to share your own unique experiences.
- Honor and be enriched by the uniqueness of your classmates.
- View your classmates as respected resources of information and knowledge.
- Appreciate the opportunity to learn from classmates who may possess skill sets that complement your own.

Meeting Federal Credit Hour Standards: The student work in this course is in full compliance with the federal definition of a four-credit hour course.

Moodle & Privacy: Moodle contains student information that is protected by the Family Educational Right to Privacy Act (FERPA). Disclosure to unauthorized parties violates federal privacy laws. Courses using Moodle will make student information visible to other students in this class. Please remember that this information is protected by these federal privacy laws and must not be shared with anyone outside the class. Questions can be referred to the Registrar's Office.

Physics 111 Lecture Schedule Fall 2019

Date	Topics	Chapter	HW due
Aug 26	Introduction	Ch. 1	
Aug 28	Motion in one dimension	Ch. 1:1-5	
Aug 30	Constant acceleration	Ch. 2:1-5	
Sep 2	Applications; Free fall	Ch. 2:6-7	
Sep 4	Motion in two dimensions: vectors	Ch. 3:1-5	
Sep 6	Projectiles	Ch. 3:6-7	HW #1
Sep 9	Forces	Ch. 4:1-5	
Sep 11	Newton's Laws	Ch. 4:6-7	
Sep 13	Application of Newton's Laws I	Ch. 5:1-4	HW #2
Sep 16	Application of Newton's Laws II	Ch. 5:5-8	
Sep 18	Review		
Sep 20	**Hour Exam I** (1D thru Appl. of N's laws)		
Sep 23	Momentum	Ch. 9:1-3	HW #3
Sep 25	Collision	Ch. 9:4-6	
Sep 27	Circular Motion	Ch. 6:1-3	
Sep 30	Gravity and Orbits	Ch. 6:4-6	
Oct 2	Rotational Motion: Torque	Ch. 7:1-4	
Oct 4	Inertia & Newton again!	Ch. 7:5-6	HW #4
Oct 7	Rolling motion and Angular Momentum	Ch. 7:7, 9:7	
Oct 9	Equilibrium	Ch. 8:1-2	
Oct 11	Springs and Elasticity	Ch. 8:3-4	HW #5
Oct 14	*Fall Break*		
Oct 16	Review		
Oct 18	**Hour Exam II** (Mom. thru Elasticity)		
Oct 21	Work and Energy	Ch. 10:1-4	
Oct 23	Energy conservation and collision	Ch. 10:6-7	
Oct 25	Power	Ch. 10:7-8	HW #6
Oct 28	Energy and transformation	Ch. 11:1-2	
Oct 30	Thermal energy and Heat	Ch. 10:5, 11:3	
Nov 1	First Law of Thermodynamics	Ch. 11:4-6	HW #7
Nov 4	Second Law and Entropy	Ch. 11:7-8	
Nov 6	Ideal Gas	Ch. 12:1-3	
Nov 8	Expansion; Specific Heat	Ch. 12:4-5	HW #8
Nov 11	Heat Transfer and Calorimetry	Ch. 12:6-8	
Nov 13	Review		
Nov 15	**Hour Exam III** (Work thru Heat)		
Nov 18	Fluids, pressure, buoyancy	Ch. 13:1-4	HW #9
Nov 20	Fluid dynamics	Ch. 13:5-7	
Nov 22	Oscillations: SHM	Ch. 14:1-4	
Nov 25	Damping and Resonance	Ch. 14:5-7	HW # 10
Nov 27	*Thanksgiving Break*		
Nov 29	*Thanksgiving Break*		
Dec 2	Waves and Sound	Ch. 15:1-4	HW #11
Dec 3	Doppler effect and Superposition	Ch. 15:7, 16:1-7	
Dec 6	Final Review		
	Final Exam (Scheduled by Registrar)	Cumulative	