Department of Physics and Engineering, Point Loma Nazarene University

PHY 241 -- University Physics I -- 4 Units

Spring 2017

Professor: Dr. Michelle Chen **E-mail:** MichelleChen@pointloma.edu
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Office Hours: M/F: 11:50 – 12:50 & 2:35 – 3:05;
W: 11:50 – 12:20; R: 2:35 – 4:00; and by appointment

Lecture: MWF 1:30 – 2:35 (T 313) January 10 – April 28, 2017
Lab: R 10:00 – 11:55; or R 12:30 – 2:25 (RS219)
Final Exam: 1:30 pm - 4:00 pm on Friday May 5, 2017

Textbook: Physics for Scientists and Engineers by Douglas Giancoli, Volume 1, 4th Edition, 2008.
Masteringphysics: Access to Mastering Physics (masteringphysics.com)
- **Course ID: PHY241PLNUSPRING2017**; Course Name: University Physics I – Spring 2017

Course Description: An analytic, calculus-based study of classical physics appropriate for science and engineering majors. Includes mechanics, waves, and thermodynamics. Lecture and laboratory. Not repeatable. Offered in the spring. Letter grading.

Learning Outcomes: This course is one of the components of the General Education Program at Point Loma Nazarene University, in support of the general education learning outcome: Quantitative Reasoning: Students will be able to solve problems that are quantitative in nature. The purpose of general education is to provide a common educational experience, to develop essential skills, aand to provide a broad cultural background for personal and professional growth. Within these broader outcomes, in this course you will:

1. translate the description of physics problems into the mathematical equations required to solve them using relevant physical principles
2. calculate solutions to physics problems once appropriate equations or techniques are identified
3. predict reasonable answers in appropriate problems, and assess the reasonableness of calculated answers
4. explain the physical meaning of the parameters in introductory physics equations
5. create and interpret graphical representations of physical quantities
6. gather and interpret data in a lab setting

PLNU Mission: To Teach ~ To Shape ~ To Send. As with all courses at PLNU, this course supports the cause to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service becomes an expression of faith. Being of Wesleyan heritage, we aspire to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life. Within this broader mission, the Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a collaborative learning environment which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christian environment for students to learn values and judgment, and pursue integration of modern scientific knowledge and Christian faith.

Department Mission: Within this broader mission, the Physics and Engineering Department at PLNU provides strong programs of study in the fields of Physics and Engineering. Our students are well prepared for graduate studies and careers in scientific and engineering fields. We emphasize a

collaborative learning environment which allows students to thrive academically, build personal confidence, and develop interpersonal skills. We provide a Christiaan environment for students to learn values and judgment, and pursue integration of modern scientific knowledge and Christian faith.

Attendance and Participation: Attendance is expected at each class session. In the event of an absence you are responsible for the material covered in class and the assignments given that day. Regular and punctual attendance at all classes is considered essential to optimum academic achievement. If the student is absent from more than 10 percent of class meetings, the faculty member can file a written report which may result in de-enrollment. If the absences exceed 20 percent, the student may be de-enrolled without notice until the university drop date or, after that date, receive the appropriate grade for their work and participation. See
http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class Attendance
in the Undergraduate Academic Catalog.

Academic Honesty: Students should demonstrate academic honesty by doing original work and by giving appropriate credit to the ideas of others. Academic dishonesty is the act of presenting information, ideas, and/or concepts as one's own when in reality they are the results of another person's creativity and effort. A faculty member who believes a situation involving academic dishonesty has been detected may assign a failing grade for that assignment or examination, or, depending on the seriousness of the offense, for the course. Faculty should follow and students may appeal using the procedure in the university Catalog. See
http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic Honesty
for definitions of kinds of academic dishonesty and for further policy information.

Academic Accommodations: If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the _rst two weeks of class to demonstrate need and to register for accommodation by phone at 619-849-2486 or by e-mail at DRC@pointloma.edu. See Disability Resource Center for additional information. For more details see the PLNU catalog. Students with learning disabilities who may need accommodations should discuss options with the instructor during the first two weeks of class. For more details see the PLNU catalog:
http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#AcademicAccommodations

Class Enrollment: It is the student's responsibility to maintain his/her class schedule. Should the need arise to drop this course (personal emergencies, poor performance, etc.), the student has the responsibility to follow through (provided the drop date meets the stated calendar deadline established by the university), not the instructor. Simply ceasing to attend this course or failing to follow through to arrange for a change of registration (drop/add) may easily result in a grade of F on the official transcript.

Credit Hour: In the interest of providing sufficient time to accomplish the stated course learning outcomes, this class meets the PLNU credit hour policy for a 4 unit class delivered over 16 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

Final Exam: The final exam date and time is set by the university at the beginning of the semester and may not be changed by the instructor. This schedule can be found on the university website and in the course calendar. No requests for early examinations will be approved. Only in the case that a student is required to take three exams during the same day of finals week, is an instructor authorized to consider changing the exam date and time for that particular student. **Final Exam: May 5th 2017, 1:30 – 4:00 pm.**

Copyright Protected Materials: Point Loma Nazarene University, as a non-profit educational institution, is entitled by law to use materials protected by the US Copyright Act for classroom education. Any use of those materials outside the class may violate the law.

Pre-Class: In preparation for each class meeting there is a reading assignment. Because class meetings are not a standard lecture format, these reading assignments are very important to help you come prepared to class. To complete the reading assignment you must answer a few questions and submit them electronically through Canvas by 8:00 am before class. Late submissions will not be accepted. This electronic communication is so important because it is your voice in what material we emphasize during class meetings and provides me constant feedback of your understanding of the material. These submissions will be graded on the following scale: 2 = demonstrates reading, 1 = room for improvement, 0 = unsatisfactory. These points are accumulated and are worth 5% of the final grade.

Homework: Masteringphysics Homework sets are due roughly each week. Homework is worth 20% of your final grade. Practicing working physics problems is critical to your success in the class, and completing this practice on time is important. Late work receives a 10% reduction in possible value per day.

Lab: Weekly lab meetings will provide you the opportunity for hands-on experience of topics from class meetings, improve lab technique, and data analysis. Labs will be performed in small groups, but each individual is responsible for submitting their own results. You must pass the lab portion of the class to pass the class.

Exam: There will be three in-class exams during the semester and one comprehensive final exam. Exams will be closed book, but a sheet of formulas will be provided to you to use during your exam. Partial credit will be given for correct reasoning at any step of a problem, but only if it is communicated clearly enough for me to understand. For problems that call for solution or explanation, no credit will be given for an answer alone; the method or reasoning must also be shown. Exams are to be taken at the time indicated in the syllabus unless other arrangements are made in advance with the professor for some unavoidable circumstance, and otherwise cannot be made up. The final examination is scheduled for 1:30 pm – 4:00 pm on Friday, May 5th. You must take ALL the exams in order to pass the class. **Final Examination Policy:** Successful completion of this class requires taking the final examination **on its scheduled day (Friday May 5th, 2017, 1:30 – 4:00 pm)**.

Assessment and Grading: The points you receive during the course are weighted accordingly:

Component	**Weight**
Pre-Class	5%
Homework	20%
Lab	20%
Tests (3)	35% (equally weighted)
Final Exam	20%

The grade you earn in this course is based on the following scale:

A	A-	B+	B	B-	C+	C	C-	D+	D	D-
S≥ 91.0	91.0 >S≥ 89.5	89.5 >S≥ 87.5	87.5 >S≥ 81.0	81.0 >S≥ 79.5	79.5 >S≥ 77.5	77.5 >S≥ 71.0	71.0 >S≥ 69.5	69.5 >S≥ 67.5	67.5 >S≥ 61.0	61.0 >S≥ 57.0

PHY241: University Physics I (Spring 2017)

(Tentative Course Calendar, Subject to Updates)

Date	**Topic**	Reading	Lab (Thursdays)
T 01/10/17	Introduction		
W 01/11/17	Measurement, Estimating	1.1-1.7	
F 01/13/17	Displacement, Velocity, Acceleration	2.1 - 2.4	
M 01/16/17	**No Class (Martin Luther King Jr. Day)**		
W 01/18/17	Motion at Constant Acceleration	2.5 - 2.6	Uncertainty
F 01/20/17	Freely Falling Objects	2.7 - 2.7	
M 01/23/17	Vectors and Scalars	3.1 - 3.5	
W 01/25/17	Vector Kinematics, Projectile Motion	3.6 - 3.8	Motion
F 01/27/17	Force, Newton's First, Second, and Third Law	4.1 - 4.5	
M 01/30/17	Mass/Weight, Normal Force, Free-Body Diagram	4.6 - 4.8	
W 02/01/17	Friction, Application of Newton's Laws	5.1 - 5.1	Forces
F 02/03/17	Catch-Up		
M 02/06/17	**Test 1**		
W 02/08/17	Uniform Circular Motion; Banked Curve	5.2 - 5.4	Frictional Forces
F 02/10/17	Gravitation; Satellite; Weightlessness	6.1 - 6.4	
M 02/13/17	Kepler's Laws	6.5 - 6.5	
W 02/15/17	Work Done by Constant and Varying Forces	7.1 - 7.3	Air Resistance
F 02/17/17	Kinetic energy and Work-Energy Principle	7.4 - 7.4	
M 02/20/17	Mechanical Energy Conservation	8.1 - 8.5	
W 02/22/17	Conservation of Energy; Escape Velocity; Power	8.5 - 8.8	Energy Conservation
F 02/24/17	Momentum Conservation; Collision and Impulse	9.1 - 9.3	
M 02/27/17	Elastic and Inelastic Collisions	9.4 - 9.7	
W 03/01/17	Catch Up		Momentum Cons.
F 03/03/17	**Test 2**		
M 03/06/17	***No Class (Spring Break)***		
W 03/08/17	***No Class (Spring Break)***		No Lab
F 03/10/17	***No Class (Spring Break)***		

M 03/13/17	Center of Mass; Angular Quantities	9.8; 10.1-3	
W 03/15/17	Torque; Rotational Dynamics; Moment of Inertia	10.4 - 10.7	Rolling Motion
F 03/17/17	Rotational Kinetic Energy, Rolling Motion	10.8 - 10.9	
M 03/20/17	Angular Momentum and Its Conservation	11.1-3, 11.6	
W 03/22/17	Equilibrium, Stability and Balance	12.1 - 12.3	Ruler Equilibrium
F 03/24/17	Fluids	Chapter 13	
M 03/27/17	Fluids	Chapter 13	
W 03/29/17	Simple Harmonic Motion	14.1 - 14.4	Fluids
F 03/31/17	Simple Harmonic Motion, Simple Pendulum	14.5, 14.6	
M 04/03/17	Damped Harmonic Motion, Resonance, Waves	14.7-8, 15.1-2	
W 04/05/17	Waves	15.3 - 15.4	SHM
F 04/07/17	Wave Properties; Standing Wave	15.5 - 15.9	
M 04/10/17	Catch Up		
W 04/12/17	**Test 3**		
F 04/14/17	***No Class (Easter)***		
M 04/17/17	***No Class (Easter)***		
W 04/19/17	Decibles, Sound in String and Air Columns	16.1 - 16.5	Musical Straws
F 04/21/17	Beats, Doppler Effect, Sonic Boom	16.6 - 16.8	
M 04/24/17	Thermo (Ideal Gas Law)	TBA	
W 04/26/17	Thermo (Special Processes)	TBA	TBA
F 04/28/17	Catch Up		
M 05/01/17			
W 05/03/17			
F 05/05/17	**Final Exam (1:30 - 4:00 pm)**		