Department of Physics and Engineering, Point Loma Nazarene University

PHY 242 -- University Physics II (4 Units) Fall 2018

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Office Hours: M 12:00 – 2:00 pm; T 10:30 am – 12:30 pm; W 1:30 – 2:30 pm; R 9:30 – 10:00 am; and by appointment

Lecture: MWF 8:30 – 9:25 pm (LA 102)
Lab: T 12:30 – 2:25 pm (LA 2)
Final Exam: 7:30 – 10:00 am, Friday December 14, 2018 (LA 102)

Textbook: *Physics for Scientists and Engineers* by Giancoli Vol 2, 4th Ed.
Access to Mastering Physics, Course ID: **PHY242PLNUFALL2018** (If you took PHY241 last semester, you do not need to register again as your access code from last semester should still work.)

Course Description: An analytic, calculus-based study of classical physics appropriate for science and engineering majors with an emphasis on electromagnetism, circuits, and optics. Lecture and laboratory. Not repeatable. Offered in the fall. Letter grade.

Student Learning Outcomes: This course supports the overall learning objectives of the physics and engineering programs in building your ability: (1) to develop an understanding of the fundamental principles of physics and of engineering (LO1), (2) to apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems (LO2), (3) to design and conduct experiments or complete an engineering design project as well as analyze and interpret data (LO3), and (4) to effectively collaborate in teams (LO6).

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, it is very important to come prepared to class. To complete the reading assignment you must answer the questions and submit them on CANVAS by 8:00 a.m. 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

Labs: Weekly lab meetings will provide you with an opportunity to have hands-on experience on lecture topics, to improve your lab technique and data analysis, and to collaborate in groups. Labs will be performed in small groups, but each individual is responsible for submitting his or her own results. Late labs will not be excepted unless there is a prior mutually agreed arrangement. You are expected to attend all the laboratory sessions. Any excused schedule conflict needs to be communicated prior to the lab meetings and a lab make-up should be scheduled. According to the university policy, absence for more than 20% of the time will result in de-enrollment without prior notice. That is, missing 3 or more labs without prior communication with the instructor will result in de-enrollment without notice.

Homework: Homework assignments will be assigned and completed using Mastering Physics at "masteringphysics.com". Your access code from last semester should still work for this semester. Late assignment will receive 20% deduction of the full grade for each day of being late.

Tests: There will be three tests during the semester in this class. A comprehensive final exam is scheduled on at 7:30 – 10:00 pm on Friday December 14th during the finals week. All of the tests and final exam is closed book. 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. No make-up exams are allowed except for warranted circumstances. You must take ALL the exams in order to pass the class.

Information Sharing: All lecture notes, lab handouts, grades, and relevant course materials will be posted on CANVAS.

Final Grade: The points you receive during the course are weighted accordingly:

Component	**Weight**
Pre-Class	5 %
Homework	15 %
Lab	20 %
Tests (3)	35 %
Final Exam	25 %

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

University Mission: Point Loma Nazarene University exists to provide higher education in a vital Christian community where minds are engaged and challenged, character is modeled and formed, and service is an expression of faith. Being of Wesleyan heritage, we strive to be a learning community where grace is foundational, truth is pursued, and holiness is a way of life.

Department 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.

Attendance: 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 Attendance Policy in the in the Undergraduate Academic Catalog.

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.

Academic Accommodations: While all students are expected to meet the minimum standards for completion of this course as established by the instructor, students with disabilities may require academic adjustments, modifications or auxiliary aids/services. At Point Loma Nazarene University (PLNU), these students are requested to register with the Disability Resource Center (DRC), located in the Bond Academic Center. (DRC@pointloma.edu or 619-849-2486). The DRC's policies and procedures for assisting such students in the development of an appropriate academic adjustment plan (AP) allows PLNU to comply with Section 504 of the Rehabilitation Act and the Americans with Disabilities Act. Section 504 (a) prohibits discrimination against students with special needs and guarantees all qualified students equal access to and benefits of PLNU programs and activities. After the student files the required documentation, the DRC, in conjunction with the student, will develop an AP to meet that student's specific learning needs. The DRC will thereafter email the student's AP to all faculty who teach courses in which the student is enrolled each semester. The AP must be implemented in all such courses.

If students do not wish to avail themselves of some or all of the elements of their AP in a particular course, it is the responsibility of those students to notify their professor in that course. PLNU highly recommends that DRC students speak with their professors during the first two weeks of each semester about the applicability of their AP in that particular course and/or if they do not desire to take advantage of some or all of the elements of their AP in that course.

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 the catalog for definitions of kinds of academic dishonesty and for further policy information.

Final Exam: Date and Time: 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 for this course is at 7:30 – 10:00 am on Friday December 14th, 2018.

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.

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 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

PHY242, University Physics II, Fall 2018

(Tentative Syllabus, Subject to Updates)

Date	Topic	Reading	Lab (Thursday)
T 08/28/18	Introduction / Charge, Insulators and Conductors	21.1 - 21.3	
W 08/29/18	Induced Charge, Electroscope, Coulomb's Law, Electric Field	21.4 - 21.6	No Lab
F 08/31/18	Electric Field, Filed Lines, Conductors, Charge Particle in E Field, Electric Dipole	21.7 - 21.11	
M 09/03/18	**No Class: Labor Day**		
W 09/05/18	Electric Flux, Gauss's Law	22.1 - 22.3	Oscilloscope
F 09/07/18	Electric Flux, Gauss's Law	22.1 - 22.3	
M 09/10/18	Electric Potential Energy, Electric Potential, Electric Field, Equipotential Surfaces	23.1 - 23.3, 23.5	
W 09/12/18	Electric Dipole Potential, E Determined from V, Electron Volt	23.4, 23.6 - 23.8	Equipotential Mapping
F 09/14/18	Electric Battery, Electric Current, Ohm's Law, Resistance, Resistivity	25.1 - 25.4	
M 09/17/18	Electric Power, Household Circuits, Alternating Current, Microscopic View of Current	25.5 - 25.8	
W 09/19/18	EMF, Terminal Voltage, Resistors/EMF in Series/Parallel, Ammeters & Voltmeters	26.1-2, 26.6-7	Ohmic/Non-Ohmic
F 09/21/18	Catch Up		
M 09/24/18	**Test 1**		
W 09/26/18	Kirchhoff's Rules; Series and Parallel EMF, Battery Changing, Electric Hazards	26.3 - 26.4	Circuits & Resistance
F 09/28/18	Capacitance	24.1 - 24.2	
M 10/01/18	RC Circuits	26.5 - 26.5	
W 10/03/18	Capacitors in Series and Parallel, Electric Energy Storage	24.3 - 24.4	RC Circuits
F 10/05/18	Dielectrics	24.5 - 24.5	
M 10/08/18	Magnets and Magnetic Fields, E Currents from B Fields, Force on Current in B Field	27.1 - 27.4	
W 10/10/18	Torque on Current Loop, Motors, Hall Effect, Mass Spectrometer	27.5 - 27.9, 29.4	Magnetic Field
F 10/12/18	B Filed from Straight Wire, Force between Two Parrallel Wires, Ampere and Coulomb	28.1 - 28.3	
M 10/15/18	Ampere's Law, Magnetic Field of Solenoid and Toroid	28.4 - 28.5	
W 10/17/18	Biot-Savart Law, Ferromagnetism	28.6 - 28.7	No Lab
F 10/19/18	**No Class: Fall Break**		
M 10/22/18	Induced EMF, Faraday's Law of Induction, Lenz's Law	29.1 - 29.3	
W 10/24/18	Electric Generators, Transformers, Power Transmission, Change B-Flux Produces E	29.4, 29.6 - 29.7	Electric Motor
F 10/26/18	Catch Up		
M 10/29/18	**Test 2**		Registration Begins
W 10/31/18	Reflection and Refraction, Image by Plane and Spherical Mirrors	32.1 - 32.4	
F 11/02/18	Snell's Law, Visible Spectrum and Dispersion, Total Internal Reflection	32.5 - 32.7	
M 11/05/18	Thin Lenses, Ray Tracing, Thin Lens Equation, Magnification, Combination of Lenses	33.1 - 33.3	
W 11/07/18	Cameras, Human Eye, Telescope, Compound Microscope	33.5 - 33.9	Lenses
F 11/09/18	Huygen's Principle, Diffraction and Refraction	34.1 - 34.2	
M 11/12/18	Interference - Young's Double Slit, Interference in Thin Films	34.3, 34.5	
W 11/14/18	Single Slit, Double Slit, Diffraction Grating	35.1, 35.3, 35.7	Interference
F 11/16/18	Polarization	35.11 - 35.11	
M 11/19/18	Ampere's Law, Gauss's Law for Magnetism, Maxwell's Equations, EM Waves	31.1-31.5	
W 11/21/18	**No Class: Thanksgiving**		No Lab
F 11/23/18	**No Class: Thanksgiving**		
M 11/26/18	EM Wave and Spectrum, Speed of Light, Energy in EM Waves, Radiation	31.6 - 31.10	
W 11/28/18	**No Class: Conference**		No Lab
F 11/30/18	Catch Up		
M 12/03/18	**Test 3**		
W 12/05/18	Catch Up		Polarization
F 12/07/18	Catch Up		
M 12/10/18			
W 12/12/18			
F 12/14/18	**Final Exam: 7:30 – 10:00 am**		