Point Loma Nazarene University **Fall 2017**

PHY 242 -- University Physics II (4 units)

Department of Physics and Engineering, Point Loma Nazarene University

Professor: Dr. Ronald DeLap
Office: Rohr Science 210 Phone: 619-849-2375 E-mail: rondelap@pointloma.edu
Office Hours: M/W/F 3-4PM, or by appointment

Meeting times:
Lecture: MWF 1:30 – 2:35 pm (Ryan 108)
Labs: R 12:30 – 2:25 pm (RS 213) Labs will be taught by Dr. Chris Gabler, RS230, x2356

Textbook: *Physics for Scientists and Engineers* by Giancoli Vol 2, 4th Edition, 2008.
Mastering physics: Access to Mastering Physics (masteringphysics.com)
Course ID**: MPDELAPFALL17** (Your account should still work if you were in PHY241 in Spring 2017, otherwise, it is ~$70 to purchase separately.)

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: In this course there are a number of specific goals for you to meet from each chapter. These smaller goals fit into the following overall course learning objectives. Once you complete this course, you should be able to:

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

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 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.

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) will result in a grade of F on the official transcript.

Academic Accommodations: If you have a diagnosed disability, please contact PLNU's Disability Resource Center (DRC) within the first 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 and the PLNU catalog for additional information. For more details see the PLNU catalog:
http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#AcademicAccommodations

Students with learning disabilities who may need accommodations should discuss options with the instructor **during the first two weeks** of class.

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.

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.

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

Pre-Class: To come prepared for each class there is a reading assignment. From time to time a quiz will be given at the beginning of class, covering the assigned reading. These quizzes will account for 5% of the grade.

Lab: 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. 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.

Homework: Weekly homework assignments will be announced on Canvas and completed using Masteringphysics at "masteringphysics.com". Practicing working physics problems is critical to your success in the class. Late work receives a 10% reduction in possible value per day.

Test: There will be three tests during the semester in this class. **A comprehensive final exam is scheduled at 1:30 – 4 pm on Monday December 11th during finals week**. All of the tests and the final exam are 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 the instructor 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**
Quizzes	5 %
Homework	10 %
Lab	20 %
Tests (3)	45 % (15% each)
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-
100 – 92.5	92.4 – 89.5	89.4 – 87.5	87.4 – 82.5	82.4 – 79.5	79.4 – 77.5	77.4 – 72.5	72.4 – 69.5	69.4 – 67.5	67.4 – 60.0	59.9 – 56.0

Course Calendar – PHY242 Fall 2017

(Tentative, subject to updates)

Date	Topic	Reading	Lab (Thursday)
T 08/29/17	Introduction / Charge, Insulators and Conductors	21.1 - 21.3	
W 08/30/17	Induced Charge, Electroscope, Coulomb's Law, Electric Field	21.4 - 21.6	
F 09/01/17	Electric Field, Filed Lines, Conductors, Charge Particle in E Field, Electric Dipole	21.7 - 21.11	
M 09/04/17	**No Class: Labor Day**		
W 09/06/17	Electric Flux, Gauss's Law	22.1 - 22.3	Electric Fields
F 09/08/17	Electric Flux, Gauss's Law	22.1 - 22.3	
M 09/11/17	Electric Potential Energy, Electric Potential, Electric Field, Equipotential Surfaces	23.1 - 23.3, 23.5	
W 09/13/17	Electric Dipole Potential, E Determined from V, Electron Volt	23.4, 23.6 - 23.8	Equipotential Mapping
F 09/15/17	Electric Battery, Electric Current, Ohm's Law, Resistance, Resistivity	25.1 - 25.4	
M 09/18/17	Electric Power, Household Circuits, Alternating Current, Microscopic View of Current	25.5 - 25.8	
W 09/20/17	EMF, Terminal Voltage, Resistors/EMF in Series/Parallel, Ammeters & Voltmeters	26.1-2, 26.6-7	Resistor Circuits
F 09/22/17	Catch Up and Review		
M 09/25/17	**Test 1**		
W 09/27/17	Kirchhoff's Rules; Series and Parallel EMF, Battery Changing, Electric Hazards	26.3 - 26.4	Resistor Circuits
F 09/29/17	Capacitance	24.1 - 24.2	
M 10/02/17	RC Circuits	26.5 - 26.5	
W 10/04/17	Capacitors in Series and Parallel, Electric Energy Storage	24.3 - 24.4	RC Circuits
F 10/06/17	Dielectrics	24.5 - 24.5	
M 10/9/17	Magnets and Magnetic Fields, E Currents from B Fields, Force on Current in B Field	27.1 - 27.4	
W 10/11/17	Torque on Current Loop, Motors, Hall Effect, Mass Spectrometer	27.5 - 27.9, 29.4	Magnetic Field
F 10/13/17	B Filed from Straight Wire, Force between Two Parallel Wires, Ampere and Coulomb	28.1 - 28.3	
M 10/16/17	Ampere's Law, Magnetic Field of Solenoid and Toroid	28.4 - 28.5	
W 10/18/17	Biot-Savart Law, Ferromagnetism	28.6 - 28.7	No Lab
F 10/20/17	**No Class: Fall Break**		
M 10/23/17	Induced EMF, Faraday's Law of Induction, Lenz's Law	29.1 - 29.3	
W 10/25/17	Electric Generators, Transformers, Power Transmission, Change B-Flux Produces E	29.4, 29.6 - 29.7	Electric Motor
F 10/27/17	Catch Up and Review		
M 10/30/17	**Test 2**		
W 11/01/17	Reflection and Refraction, Image by Plane and Spherical Mirrors	32.1 - 32.4	Mirrors
F 11/03/17	Snell's Law, Visible Spectrum and Dispersion, Total Internal Reflection	32.5 - 32.7	
M 11/06/17	Thin Lenses, Ray Tracing, Thin Lens Equation, Magnification, Combination of Lenses	33.1 - 33.3	
W 11/08/17	Cameras, Human Eye, Telescope, Microscope	33.5 - 33.9	Lenses
F 11/10/17	Huygen's Principle, Diffraction and Refraction	34.1 - 34.2	
M 11/13/17	Interference - Young's Double Slit, Interference in Thin Films	34.3, 34.5	
W 11/15/17	Single Slit, Double Slit, Diffraction Grating	35.1, 35.3, 35.7	Interference
F 11/17/17	Polarization	35.11 - 35.11	
M 11/20/17	Ampere's Law, Gauss's Law for Magnetism, Maxwell's Equations, EM Waves	31.1-31.5	
W 11/22/17	**No Class: Thanksgiving**		No Lab
F 11/24/17	**No Class: Thanksgiving**		
M 11/27/17	EM Wave and Spectrum, Speed of Light, Energy in EM Waves, Radiation	31.6 - 31.10	
W 11/29/17	Polarization		TBD
F 12/01/17	Catch Up and Review		
M 12/04/17	**Test 3**		
W 12/06/17	Review for final		No Lab
F 12/08/17	Review for final		
M 12/11/17	**Final Exam: 1:30 pm**		
W 12/13/17			
F 12/15/17			