

Point Loma Nazarene University

PSC110-01: Physical Science

3.0 units

Course Syllabus, Fall 2016

Instructor:	Christopher T. Gabler	Dr. Tracey Schalnatz
E-mail:	cgabler@pointloma.edu	traceyschalnat@pointloma.edu
Office:	Rohr Science 209	Rohr Science 302
Office hours:	MW 2:00–3:30 T 2:30 – 3:30, R 9:00-10:15 and by appointment	TBA
Phone:	619.849.2356, 858.354.8762	619.849.2717
	Class Meeting Time:	(T 106) 8:30-9:25 MWF
	Laboratory Meeting Time:	(RS 213) 1:30-3:20 W – Section I (RS 213) 3:30-5:20 R – Section II

PLNU Mission

To Teach ~ To Shape ~ To Send

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 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.

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.

Materials – Textbook: *Conceptual Physical Science*, 5th edition by Hewitt, Suchocki, and Hewitt.

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Course Description – PSC 110 is an introductory survey of selected principles in physics and chemistry with a discussion of related societal and environmental issues. (Meets a general education requirement; does not count toward the Chemistry or Physics major.) Pre or Corequisite: [PSC 110L](#) and [MTH 099](#) or equivalent.

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, and to provide a broad cultural background for personal and professional growth.

The main topics are covered in two parts: Part I (Physics): motion, energy, heat, waves, electricity, and light; Part II (Chemistry): the atom, chemical bonds, chemical reactions, water and solutions, organic chemistry and nuclear reactions. The study of these topics in physics and chemistry are an attempt to illuminate and reveal the properties of matter, and demonstrate the physical attributes of its motion through space to the student.

Course Learning Outcomes (CLOs) – An emphasis is placed on both conceptual understanding and the ability to solve problems dealing with the concepts studied. As part of the General Education at Point Loma this particular course places a particular emphasis on quantitative reasoning, particularly through the lens of the physical sciences. Specifically students should be able to:

1. Explain everyday observations of the natural world in terms of chemistry and physics.
2. Translate the description of problems into the equations required to solve them using relevant physical principles.
3. Find solutions to problems once appropriate equations or techniques are identified.
4. Create and interpret graphical representations of quantities (motion graphs, standing waves, etc.)
5. Gather and interpret data in a lab setting.

General Education Learning Outcomes: GELO 1e will be assessed directly using problems on the final exam that are quantitative in nature.

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 [http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class Attendance](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Class%20Attendance) in the Undergraduate Academic Catalog.

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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.

Class Meetings – Learning physics and chemistry requires active learning and participation during class and lab. In preparation for each class meeting there is a reading assignment. To maximize your learning and participation during our meetings it is very important that you have read this material before class.

Lab – You will participate in a lab designed to give you hands-on experience with the concepts covered in the class meetings. Lab will also provide an opportunity for you to use instruments common to the physical sciences, perform measurements, and analyze data using the scientific method. Labs will be completed in small groups, with each member of the team completing his or her own worksheet. Labs comprise 20% of your final grade. You must pass the lab portion of the class to pass the course.

Homework – Homework/reading quizzes is worth 10% of your final grade. A majority of the homework grade will be short problem quizzes given in class based on the pre-assigned reading.

Submission: Written homework solutions should be worked neatly in clear logical steps. (Solutions and explanations should be clear enough that one of your peers could easily follow what you did if they had not worked the problem before.)

Collaboration: We expect and encourage collaboration between you and your peers while working on your homework, but your work should be your own original solutions. Allow adequate time to work and think about problems by yourself first before you work together with your peers or ask questions of me.

When you sit down to write up a problem, you should not use notes copied from someone else. The guideline is that you should have no trouble explaining or repeating work that you turn in.

Late Submission: Up to one late assignment per quad will be accepted late with a 10% reduction in grade for every day it is late. This begins with a 10% reduction for an assignment turned in later in the day after this homework has been collected at the beginning of class.

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Exams – Examinations will be given in class, which count toward 40% of your final grade, two during each section. The final exam is comprehensive and counts for 15% of your grade. Exams will

be closed book. Partial credit will be given for correct reasoning at any step of the problem, but only if it is communicated clearly enough for me to understand. For problems that call for a solution or explanation, no credit will be given for an answer alone; the method or reasoning must also be shown.

Policy for missed exams: Unless you have express written permission from me long before the date of the exam to take the exam on another day, there will be no makeup exams for this course. The **Final Exam** date for this class is **Monday, December 12, 2016 – 7:30- 10:00 a.m. This date will not change.**

Final Grades – The grade you earn in this course is roughly based on the following scale: 100%-92% A, 92%-89.5% A-, 89.5%-87% B+, 87%-82% B, 82%-79.5% B-, 79.5%-77% C+, 77%-72% C, 72%-69.5% C-, 69.5%-67% D+, 67%-62% D, 62%-59.5% D-.

The points you receive during the course are weighted accordingly: in-class quizzes: 15%, labs: 20%, homework/reading quizzes: 10%, exams (4): 40%, final exam: 15%.

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 [Academic Policies](#) 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 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](#) for additional 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. The **Final Exam** date for this class is **Monday, December 12, 2016 – 7:30- 10:00 a.m.**

COPYRIGHT POLICY

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

FERPA Policy: In compliance with federal law, neither PLNU student ID nor social security number should be used in publicly posted grades or returned sets of assignments without student written permission. This class will meet the federal requirements by (Note: each faculty member should choose one strategy to use: distributing all grades and papers individually; requesting and filing written student permission; or assigning each student a unique class ID number not identifiable on the alphabetic roster.). Also in compliance with FERPA, you will be the only person given information about your progress in this class unless you have designated others to receive it in the "Information Release" section of the student portal. See Policy Statements in the (undergrad/graduate as appropriate) academic catalog.

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PHYSICAL SCIENCE 110-01 PART I: PHYSICS CLASS SCHEDULE

Professor Christopher Gabler

Rohr Science 209, 619-849-2356, cgabler@pointloma.edu

Office Hours: MW 2:00 –3:30, T 2:30 – 3:30, R 9:00-10:15 and by appointment

LECTURE SCHEDULE (*tentative*)

DATE	TOPICS	Ch. Reading	LAB
T 08/30	Quad I – Introductions (Monday schedule)	Intro	#1 Motion
W 08/31	Units Motion, Equilibrium	1.1 – 1.7	
F 09/02	Motion and Equilibrium	1.8 – 1.10	#2 Meter Stick
M 09/05	Labor Day Holiday – No Class		
W 09/07	Newton’s Laws of Motion	2.1 – 2.5	
F 09/09	Momentum and Energy	3.1 - 3.4	#3 Energy & Momentum
M 09/12	Momentum and Energy	3.5 – 3.10	
W 09/14	Fluid Mechanics	5.1 – 5.8	
F 09/16	Thermal Energy	6.1 – 6.7	#4 Buoyancy
M 09/19	Thermal Energy and Heat Transfer	6.7 – 6.9, 7.1 – 7.4	
W 09/21	EXAM #1		
F 09/23	Heat Transfer and Change of Phase	7.5 – 7.9	#5 Electricity
M 09/26	Electricity	8.1 – 8.6	
W 09/28	Electricity	8.7 – 8.10	
F 09/30	Magnetism	9.1 – 9.5	#6 Sound
M 10/03	Waves and Sound	10.1 – 10.6	
W 10/05	Light E-M Spectrum	10.7 – 10.10	
F 10/07	Light, Reflection, Refraction	11.1 – 11.4	#7 Light and Lenses
M 10/10	<i>Introduction to Chemistry: Atoms, Elements, Atomic Particles</i>	11.5 – 11.7	
W 10/12	<i>The Periodic Table and Groups, Quad I</i> Physics Review	12.1-12.4	
F 10/14	Chemistry and Properties , Physics Review	12.1-12.4	No Lab
M 10/17	EXAM #2 Physics		
W 10/19	Chemistry: Introduction/Atoms and the periodic table	12.4-	

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PHYSICAL SCIENCE 110 PART II: CHEMISTRY

Dr. Tracey Schalnat

Rohr Science 302D, 619-849-2717, traceyschalnat@pointloma.edu

Office Hours: MF 9:00 – 10:30, W 1:30 – 3:00, R 9:00 – 10:30 and by appointment

LECTURE SCHEDULE (*tentative*)

DATE	TOPICS	CHPTS	LAB
W 10/19	Introduction/Atoms and the periodic table	12	No Lab
F 10/21	Fall break- no class		
M 10/24	Atoms and the periodic table/Elements of Chemistry	12, 14	Atomic line spectra
W 10/26	Elements of Chemistry/How Atoms Bond and Molecules attract	14, 15.1-2	
F 10/28	How Atoms Bond and Molecules Attract	15.3-15.5	
M 10/31	How Atoms Bond and Molecules Attract	15.6 – 15.8	Chromatography
W 11/2	Mixtures	16	
F 11/4	Mixtures		
M 11/7	EXAM #1	12, 14-16	Reaction Rates
W 11/9	How Chemicals React	17	
F 11/11	How Chemicals React	17	
M 11/14	How Chemicals React	17	Chemical Reactions
W 11/16	Two Classes of Chemical Reactions	18	
F 11/18	Two Classes of Chemical Reactions	18	
M 11/21	Two Classes of Chemical Reactions	18	No Lab
W 11/23	Thanksgiving Recess-no class		
F 11/25	Thanksgiving Recess-no class		
M 11/28	Organic chemistry	19	Acid Base Titration of antacids
W 11/30	Organic chemistry	19	
F 12/2	EXAM #2	17-19	
M 12/5	The Atomic Nucleus and Radioactivity	13	Organic Models
W 12/7	The Atomic Nucleus and Radioactivity	13	
F 12/9	Final Review		
	FINAL EXAM 12/12 Monday 7:30-10am	12-20	

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