

**PSC110-01: Physical Science****Course Syllabus, Spring 2016**

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|---------------|------------------------------------------------------------------|-----------------------------------------------------------------------|
| Instructor:   | Christopher T. Gabler                                            | Dr. Matthieu Rouffet                                                  |
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| Office:       | Rohr Science 209                                                 | Rohr Science 305C                                                     |
| Office hours: | MW 1:30 – 2:30<br>TR 1:00 – 2:30 and by appointment              | TBA                                                                   |
| Phone:        | 619.849.2356                                                     | 619.849.3278                                                          |
|               | Class Meeting Time:                                              | (RLC 102) 8:30-9:25 MWF                                               |
|               | Laboratory Meeting Time:                                         | (RS 213) 2:45-4:35 W – Section I<br>(RS 213) 3:00-4:50 R – Section II |

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**PLNU Mission****To Teach ~ To Shape ~ To Send**

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.

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

**Course Description** – Physical Science is a one-semester course designed to introduce you to selected principles in physics and chemistry and how these relate to various societal and environmental issues. 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. This course will reveal the beauty, design, structure and behavior of the created universe and show the imaginative mind of the Creator Himself.

**Course Objectives** – 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.

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**Course Objectives (continued):** 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.

**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 is worth 10% of your final grade.

*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. The **Final Exam** date for this class is **Friday, May 6, 2016 – 7:30- 10:00 a.m.**

**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: 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](mailto:DRC@pointloma.edu). See [Disability Resource Center](#) for additional information.

#### **FINAL EXAMINATION POLICY**

Successful completion of this class requires taking the final examination **on its scheduled day**. The final examination schedule is posted on the Class Schedules site. No requests for early examinations or alternative days will be approved. The **Final Exam** date for this class is **Friday, May 6, 2016 – 7:30- 10:00 a.m.**

#### **COPYRIGHT POLICY**

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**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

Professor Christopher Gabler

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

### LECTURE SCHEDULE (*tentative*)

| DATE           | TOPICS                                                              | Ch. Reading          | LAB                  |
|----------------|---------------------------------------------------------------------|----------------------|----------------------|
| T 01/12        | <b>Quad I</b> - Introductions                                       | Intro                | #1 Motion            |
| W 01/13        | Units Motion, Equilibrium                                           | 1.1 – 1.7            |                      |
| F 01/15        | Motion and Equilibrium                                              | 1.8 – 1.10           | #2 Meter Stick       |
| <b>M 01/18</b> | <b>Martin Luther King Jr. – No Class</b>                            |                      |                      |
| W 01/20        | Newton's Laws of Motion                                             | 2.1 – 2.5            |                      |
| F 01/22        | Momentum and Energy                                                 | 3.1 - 3.4            | #3 Energy & Momentum |
| M 01/25        | Momentum and Energy                                                 | 3.5 – 3.10           |                      |
| W 01/27        | Fluid Mechanics                                                     | 5.1 – 5.8            |                      |
| F 01/29        | Thermal Energy                                                      | 6.1 – 6.7            | #4 Buoyancy          |
| M 02/01        | Thermal Energy and Heat Transfer                                    | 6.7 – 6.9, 7.1 – 7.4 |                      |
| W 02/03        | EXAM #1                                                             |                      |                      |
| F 02/05        | Heat Transfer and Change of Phase                                   | 7.5 – 7.9            | #5 Electricity       |
| M 02/08        | Electricity                                                         | 8.1 – 8.6            |                      |
| W 02/10        | Electricity                                                         | 8.7 – 8.10           |                      |
| F 02/12        | Magnetism                                                           | 9.1 – 9.5            | #6 Sound             |
| M 02/15        | Waves and Sound                                                     | 10.1 – 10.6          |                      |
| W 02/17        | Waves and Sound                                                     | 10.7 – 10.10         |                      |
| F 02/19        | Light, the E-M Spectrum                                             | 11.1 – 11.4          | #7 Light and Lenses  |
| M 02/22        | Light, Reflection, Refraction                                       | 11.5 – 11.7          |                      |
| W 02/24        | <i>Introduction to Chemistry: Atoms, Elements, Atomic Particles</i> | 12.1-12.4            |                      |
| F 02/26        | <i>The Periodic Table and Groups, Quad I</i> Physics Review         | 12.1-12.4            |                      |
| M 02/29        | Exam #2                                                             |                      |                      |
| W 03/02        | <b>Quad II</b> - Chemistry                                          | Chapter 12           |                      |