

PLNU Mission Statement

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 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.

Professor: Dr. Heide Doss

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Office Hours: MF 8:30-10:30; 12-1, W 9:30-10:30, 12-1, T Th 11:30-1:00 or by appointment

Regular meeting times August 30, 2016 – December 9, 2016 (NOTE: T 8/30 is a M schedule)

Lecture: MWF 11:00 AM – 11:55 AM (Rohr Science 219)

Final Exam: Wed Dec 14, 2016, 10:30 AM to 1:00 PM

Textbook: Introduction to Quantum Mechanics 2nd Ed., by David J. Griffith, Pearson/Prentice Hall 2005

Course Description: A rigorous introduction to quantum physics including Schrödinger's equation, matrix mechanics, perturbation theory, and applications in atomic and molecular physics.

Prerequisite(s): PHY 304 and MTH 274.

Recommended: MTH 333

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 learning outcomes of the physics and engineering programs to: develop an understanding of the fundamental principles of physics and of engineering; apply physical principles, mathematical reasoning, and computational techniques to solve real-world problems; analyze and interpret data; and effectively communicate complicated technical information. Once you complete this course, you should be able to:

1. apply quantum mechanical principles to several situations;
2. explain the physical meaning of the mathematical formulation;
3. articulate the big ideas from each section of each chapter such as the wave function, stationary states, potential energy wells, observables, the uncertainty principle, the three-dimensional Schrödinger equation, the hydrogen atom, systems of identical particles;
4. justify and explain your thinking and approach to a problem or physical situation; and
5. sketch and interpret relevant diagrams (such as energy level diagrams or sketches of wave functions and their probabilities.)

Pre-class Assignments: Preclasses are assigned for each class day and are due before class (10:00 AM). Your responses to the pre-class questions are graded as follows: 2 = demonstrates reading of material and thinking about material; 1 = room for improvement; 0 = unsatisfactory. Pre-class comprises 5% of your grade.

Homework/Classwork: Problems assigned throughout the course are essential to your learning the material. Problems in this course are largely analytic but may be complemented by computational methods. Problems should be worked neatly in clear logical steps. Solutions should be clear enough that one of your peers could easily follow what you did if they had not worked the problem before. Homework/Classwork comprises 20% of your grade. HW sets are due at the beginning of class and will not be accepted late. Classwork cannot be made up.

Collaboration: Scientists and engineers collaborate, and I expect and encourage you to collaborate with your peers while working on homework and labs, however your work should be your own. The guideline is that you should have no trouble explaining or repeating the work you turn in. No homework solutions should look identical.

Late Work: Late work will not be accepted unless there is a documented emergency. Assignments are due as noted on the syllabus, in class, and on Canvas. Incompletes are only assigned in extremely unusual circumstances.

You must take ALL the exams and the final in order to pass the class.

Tests: There will be five in-class tests during the semester, each worth 11% of your grade. Tests make a total of 55% of your grade. You must take all exams to pass the course.

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 is set for **Wed, Dec 14, 2016 at 10:30 AM to 1:00 PM.** 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 is worth 20% of your grade.

Missed Exam Policy: No make-up exams are allowed except for warranted circumstances. Arrangements must be made with me as soon as possible.

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

Component	Weight
Pre-Class	5%
Homework/Classwork	20%
Tests (5)	55% (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 \geq 91.5	91.5 >S \geq 89.5	89.5 >S \geq 86.5	86.5 >S \geq 81.5	81.5 >S \geq 79.5	79.5 >S \geq 76.5	76.5 >S \geq 71.5	71.5 >S \geq 69.5	69.5 >S \geq 66.5	66.5 >S \geq 61.5	61.5 >S \geq 59.5

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.

PLNU Attendance and Participation Policy:

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) may easily 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](#) for additional information. For more details see the PLNU catalog: [http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic Accommodations](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Accommodations)

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

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 any 4 unit class delivered over 15 weeks. Specific details about how the class meets the credit hour requirements can be provided upon request.

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.

PLNU Academic Honesty Policy:

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](http://catalog.pointloma.edu/content.php?catoid=24&navoid=1581#Academic_Honesty) for definitions of kinds of academic dishonesty and for further policy information.

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 distributing grades and papers individually. 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 academic catalog.

TENTATIVE SCHEDULE – subject to updates

Time spent outside of class should be between 2 and 3 hours per credit hour per week

Pre-class assignments on Canvas are due by 10:00 AM, unless otherwise noted

Date	Topics and Readings	Assignments
8/30/16 T follows a M schedule	<i>Readings are due before class starts, the first day is an exception. Today's work is due by Thursday night.</i> Read entire preface of Griffith. Chapter 1.1-1.3	Pre-classes are due by 10:00 AM the day of class. The first pre-class is an exception, It is due by Thursday night. pre-class 1 due by 8/31/16 10:00 AM HW 1 due 9/2/16 Problems 1.1, 1.2, 1.3 See Canvas for full assignment
8/31/16 W	Chapter 1.4-1.5	pre-class 2 HW 2 due 9/6 P: 1.5, 1.7 + See Canvas for full assignment. Put in my mailbox by 11AM
9/2/16 F	Chapter 1.6	pre-class 3 due HW 3 due 9/7 P: 1.9, 1.10, 1.14, 1.16, 1.17
9/5/16 M	LABOR DAY – NO CLASSES	HW 2 due 9/6 put in my mailbox by 11 AM
9/7/16 W	Review	pre-class 4 due HW 3 due
9/9/16 F	Exam 1 Chapter 1	pre-class 5 due HW 4 due 9/12 Problems 2.1, 2.2
9/12/16 M	Chapter 2.1-2.2	pre-class 6 due HW 4 due HW 5 due 9/16 Problems 2.3, 2.4, 2.5, 2.7
9/14/16 W	Chapter 2.2-2.3.1	pre-class 7 due HW 6 due 9/19 Problems 2.10, 2.11, 2.12 See Canvas for full assignment
9/16/16 F	Chapter 2.3.1-2.3.2	pre-class 8 due HW 5 due HW 7 due 9/21 Problem 2.17
9/19/16 M	Chapter 2.3.2	pre-class 9 due HW 6 due
9/21/16 W	Chapter 2.4	pre-class 10 due HW 7 due HW 8 due 9/23 Problems 2.20, 2.22
9/23/16 F	Chapter 2.5	pre-class 11 due HW 8 due HW 9 due 9/26 P: 2.23, 2.26, 2.27 HW 10 due 9/28 Problems 2.29, 2.34, 2.38
9/26/16 M	Chapter 2.6	pre-class 12 due HW 9 due
9/28/16 W	Chapter 2 review /catch up	pre-class 13 due HW 10 due

Date	Topics and Readings	Assignments
9/30/16 F	EXAM 2 Chapter 2	pre-class 14 due Read ch 3 HW11 due 10/5 Problems 3.2, 3.3 HW 12 due 10/7 Problems A.8, A.9, A.11
10/3/16 M	Read the Appendix and Chapter 3.1-3.2	pre-class 15 due
10/5/16 W	Chapter 3.3	pre-class 16 due HW 11 due
10/7/16 F	Chapter 3.4 – 3.5	Pre-class 17 due HW 12 due HW 13 due 10/10 Problems 3.11, 3.12
10/10/16 M	Chapter 3.5	pre-class 18 due HW 13 due HW 14 due 10/12 Problems 3.13, 3.14, 3.17
10/12/16 W	Chapter 3.6	pre-class 19 due HW 14 due HW 15 due 10/17 Problem 3.30, 3.31, 3.36, 3.37
10/14/16 F	Review Chapter 3/ catch up	pre-class 20 due
10/17/16 M	EXAM 3 Chapter 3	pre-class 21 due HW 15 due
10/19/16 W	Chapter 4.1	pre-class 22 due HW 16 due 10/24 Problems 4.1, 4.2, 4.3, 4.5
10/21/16 F	NO CLASSES Fall Break Day	
10/24/16 M	Chapter 4.1 – 4.2	pre-class 23 due HW 16 due HW 17 due 10/28 P: 4.10, 4.11, 4.12, 4.13, 4.16
10/26/16 W	Chapter 4.2	pre-class 24 due
10/28/16 F	Chapter 4.2 – 4.3	pre-class 25 due HW 17 due HW 18 due 11/2 P: 4.18, 4.19, 4.21, 4.22
10/31/16 M	Chapter 4.3	pre-class 26 due HW 19 due 11/4 Problems 4.28, 4.29
11/2/16 W	Chapter 4.3-4.4	pre-class 27 due HW 18 due
11/4/16 F	Chapter 4.4	pre-class 28 due HW 19 due HW 20 due 11/11 Problems 4.34, 4.38, 4.44, 4.45, 4.55

Date	Topics and Readings	Assignments
11/7/16 M	Chapter 4.4	pre-class 29 due
11/9/16 W	Chapter 4 review/ catch up	pre-class 30 due
11/11/16 F	Exam 4 Chapter 4	pre-class 31 due HW 20 due HW + See Canvas due 11/28
11/14/16 M	Chapter 5.1	pre-class 32 due HW 21 due 11/16 Problem 5.4
11/16/16 W	Chapter 5.1	pre-class 33 due HW 21 due HW 22 due 11/18 Problem 5.6
11/18/16 F	Chapter 5.2	pre-class 34 due HW 22 due HW 23 due 11/21 Problems 5.9, 5.12, 5.13
11/21/16 M	Chapter 5.3	pre-class 35 due HW 23 due HW 24 due 11/28 Problems 5.15, 5.16
11/23-25 W Th F	NO CLASSES Thanksgiving Break	
11/28/16 M	Chapter 5.3-5.4	pre-class 36 due HW 24 due HW + due HW 25 due 12/2 Problems 5.22, 5.23, 5.24
11/30/16 W	Chapter 5.4	pre-class 37 due
12/2/16 F	Chapter 5.4	pre-class 38 due HW 25 due HW 26 due 12/7 Problems 5.27, 5.30, 5.31, 5.32, 5.33
12/5/16 M	Review Chapter 5 / catch up	pre-class 39 due
12/7/16 W	Exam 5 Chapter 5	pre-class 40 due (review) HW 26 due
12/9/16 F	REVIEW	pre-class 41 due (review)
12/14/16 W	FINAL EXAM 10:30 am - 1:00 pm	
	Grades turned in by Dec25	