**Quantum Mechanics II**

**Phys 486 & 686 – Tues/Thurs 2:00-3:15p**

**Warren Christensen**

**Griffith’s Quantum Mechanics 2nd/3rd Edition**

Course Goals:

1. Acquisition of content knowledge concerning mathematics and physics.

2. Demonstration of participation and communication with your peers and with the instructor.

3. Reflection on learning and studying and performance on assessments within the course.

4. Communicating ideas verbally to the instructor.

The activities and assessments through which we will achieve these goals will be different from many of your other upper-division physics courses.

Traditional homework assignments will be assigned but will not be graded. Quizzes will be administered weekly that will be strongly tied to the assigned homework problems. I will encourage you to use all available resources, including solutions to textbook problems, to develop the best possible understanding of how these problems are to be solved. Solving the problems with the aid of a solution may be an essential first step but solving it and being able to explain all the necessary steps within that solution are going to be essential to true understanding of a problem’s solution. Quizzes will attempt to ask questions similar to questions presented in the homework or to extend the answers to those questions a few steps further. Having a robust understanding of the homework set should, in principal, give one an excellent opportunity to demonstrate understanding on the quiz. If the overall class score is far below the expectations of the instructor, the quiz will be re-graded (or scaled if you will) using a different set of parameters to reflect expectations more appropriate to the difficulty of a particular assessment. *You will be able to use your book and your notes for these quizzes.*

Questions and assistance on homework or any questions at all regarding the course or assessment performance will be readily welcomed during office hours and other arranged times.

Class participation will be required. An outcome of this course is item #2 above. In order to assess this, the instructor will constantly monitor the class looking for evidence of participation. Class attendance is expected. Points will be awarded for the following participation: 1. Turning in Reading Questions at the beginning of every class. 2. Actively listen and talking within small group activities, 3. Asking questions relevant to the material being discussed in class, 4. Other measures that the students and instructor agree to on the first day of class. If the sole purpose of this class were to develop and demonstrate content knowledge this requirement would not be necessary, but that is NOT the sole goal of this course.

Mid-term Exams will be given at four times during the semester, the first will be given the fourth week of class, Feb 6th. Mid-term Exams will aim to be aligned with the homework and quizzes that have been previously used to teach and assess the content. After being completed, the exams will be used, to the extent possible, to provide an opportunity to students to demonstrate mastery. A student, after reviewing and study on the questions they performed poorly on for the exam, will have an opportunity to meet with the instructor and demonstrate a more complete understanding. The student can work through as many problems as they would like. They must do so without the aid of any notes except for the exam itself. Students will work the problem(s) on the board for the instructor explaining the reasoning for specific steps in the problem. Doing so can earn a majority of lost points on the exam question. Additional points may be earned back when a student can correctly explain other issues that caused them trouble on the exam and what they now understand about that problem having completed it. This will be done one-on-one within the S Engineering Conference room. The element of mastery is important, and thus, Mid-terms will be given a more significant weight, when compared to course assessments that do not include a mastery element. All students will be required to do this at least once in the semester as a demonstration of their communication skills (Goal 4).

The Final Exam will be cumulative and assess knowledge consistent with the courses’ Mid-term Exams, homework and quizzes.

PHYS 686 students only: Students in 686 will complete a project during the semester. The project will be to work with the professor to develop a class teaching unit for the course. They will work in the weeks leading up to the class they will teach with all available materials the instructor uses to develop a class that falls in line with the expectations of the course format. They will develop homework assignments, a quiz. Starting at least two weeks prior to the unit they are teaching the student will work with the instructor to prepare questions for inside and outside of class. The project will be assessed on an Acceptable or Unacceptable standard. Plans for the unit to be covered will be made in the first 2 weeks of class.

Late work will not be acceptable for class. Things are due the day it is due, quizzes are taken in class. If you think there will be a problem for you regarding regular class attendance, please speak with me now.

Grade Breakdown for Phys 486

|  |  |  |
| --- | --- | --- |
| **Assessment** | **Weights** |  |
| Homework | 0 parts (for quiz preparation only) | (0 parts)/(15 parts) = 0% |
| Quizzes | 4 parts | (4 parts)/(15 parts) = 27% |
| Midterm Tests | 6 parts | (6 parts)/(15 parts) = 40% |
| Final Exam | 2 parts | (2 parts)/(15 parts) = 13% |
| Participation | 3 parts | (3 parts)/(15 parts) = 20% |

Grade Breakdown for Phys 686

|  |  |  |
| --- | --- | --- |
| **Assessment** | **Weights** |  |
| Homework | 0 parts (for quiz preparation only) | (0 parts)/(15 parts) = 0% |
| Quizzes | 4 parts | (5 parts)/(15 parts) = 27% |
| Midterm Tests | 5 parts | (4 parts)/(15 parts) = 40% |
| Final Exam | 2 parts | (2 parts)/(15 parts) = 13% |
| Participation | 3 parts | (3 parts)/(15 parts) = 20% |
|  |  |  |
| Project | Acceptable or Unacceptable |  |

Week/Class Breakdown

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Week | Class | Assigned | Returned | Notes |
|  | 0 | 0 | Chat with Warren in first two weeks |  |  |
| Jan 14 | 1 | 1 | Readings |  |  |
| Jan 16 |  | 2 | **Quiz 1**, Homework, and Readings |  | Quiz during last 15 minutes of class |
| Jan 21 | 2 | 3 | Readings | Quiz 1 |  |
| Jan 23 |  | 4 | **Quiz 2**, Homework, and Readings |  |  |
| Jan 28 | 3 | 5 | Readings | Quiz 2 |  |
| Jan 30 |  | 6 | **Quiz 3**, Homework, and Readings |  |  |
| Feb 4 | 4 | 7 | Readings | Quiz 3 |  |
| Feb 6 |  | 8 | ***Test 1***, Homework |  |  |
| Feb 11 | 5 | 9 | Readings | Test 1 | Prepare for Mastery Presentation |
| Feb 13 |  | 10 | **Quiz 4**, Homework, and Readings |  | Prepare for Mastery Presentation |
| Feb 18 | 6 | 11 | Readings | Quiz 4 | Mastery Presentation for Test 1 |
| Feb 20 |  | 12 | **Quiz 5**, Homework, and Readings |  | Mastery Presentation for Test 1 |
| Feb 25 | 7 | 13 | Readings | Quiz 5 |  |
| Feb 27 |  | 14 | ***Test 2***, Homework |  |  |
| Mar 3 | 8 | 15 | Readings | Test 2 | Prepare for Mastery Presentation |
| Mar 5 |  | 16 | **Quiz 6**, Homework, and Readings |  | Prepare for Mastery Presentation |
| Mar 10 | 9 | 17 | Readings | Quiz 6 | Mastery Presentation for Test 2 |
| Mar 12 |  | 18 | **Quiz 7**, Homework, and Readings |  | Mastery Presentation for Test 2 |
| Mar 24 | 10 | 19 | Readings | Quiz 7 |  |
| Mar 26 |  | 20 | ***Test 3***, Homework |  |  |
| Mar 31 | 11 | 21 | Readings | Test 3 | Prepare for Mastery Presentation |
| Apr 2 |  | 22 | **Quiz 8**, Homework, and Readings |  | Prepare for Mastery Presentation |
| Apr 7 | 12 | 23 | Readings | Quiz 8 | Mastery Presentation for Test 3 |
| Apr 9 |  | 24 | **Quiz 9**, Homework, and Readings |  | Mastery Presentation for Test 3 |
| Apr 14 | 13 | 25 | Readings | Quiz 9 |  |
| Apr 16 |  | 26 | **Quiz 10**, Homework,and Readings |  |  |
| Apr 21 | 14 | 27 | Readings | Quiz 10 |  |
| Apr 23 |  |  | ***Quiz 11***, Homework and Readings |  |  |
| Apr 28 |  | 28 | Readings |  |  |
| Apr 30 | 15 | 29 | ***Test 4*** |  |  |
| May 5 |  | 30 |  | Test 4 | Prepare for Mastery Presentation |
| May 7 | 16 | 31 |  |  | Mastery Presentation for Test 4 |
| May 14 3:30p |  |  | Final exam |  |  |