**Quantum Mechanics I**

**Phys 485 – Tues/Thurs 9:30-10:45p**

**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 (GASP!), to develop the best possible understanding of how these problems are to be solved. Solving the problems with the aid of a solution can be an essential first step but solving it and being able to explain all the necessary steps within that solution (eventually) without the aid of the 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. 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, Sept 17th. 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 (either in-person or remotely) 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.

Late work will not be acceptable for class. Things are due the day it is due, quizzes are taken during 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% |

**Learning in a Pandemic**

According to [NDSU Policy 333](http://www.ndsu.edu/fileadmin/policy/333.pdf), attendance in classes is expected and important. Students are expected to attend every class (either face-to-face or synchronously online) and remain in class for the duration of the session when it is safe to do so in accordance with NDSU guidance regarding COVID-19. Absences interfere with our ability to prepare you to be an informed consumer of science. **Please** **do not attend class face-to-face if you are sick, attend synchronously online instead.** Please protect your health and the health of others by staying home and participating in class remotely.  Do not come to class if you have been exposed to individuals who tested positive for COVID-19 and/or you have been notified to self-quarantine due to exposure. For information on COVID-19, symptoms, testing, and steps to stay healthy see <https://www.ndsu.edu/studenthealthservice/covid_19/>. If you are absent from class (either face-to-face or synchronously online) as a result of a COVID-19 diagnosis or quarantine, contact Dr. Christensen to discuss any missed deadlines or course content.

This semester we will heavily rely on technology to ensure the safety of both the students and the instructional team. You will be expected to use a number of different platforms to demonstrate your understanding of course material. Many of your assignments will require you to have access to a computer and you may also be asked to take photos of the work you are submitting. **Please contact Dr. Christensen if you do not have regular access to a computer (a tablet will not be sufficient), reliable internet, and camera (cell phones work!)**.

You will be expected to check Blackboard and your NDSU email frequently as these platforms will be our first line of communication regarding important course information. You should also feel comfortable emailing your instructors with issues or questions you might have about the course. When emailing instructors, you should expect a response within 24 hours during weekdays. Messages received on weekends or during holidays may not be answered within this time frame. In addition, **all email messages to instructors should include PHYS 485 in the subject line**.

**NDSU requires students to wear face coverings in classrooms.** Wearing face coverings

helps reduce the risk to others in case you are infected but do not have symptoms.

* You must properly wear a face covering (covering both the mouth and nose) for the entirety of the class. If you fail to properly wear a face covering, you will not be admitted to the classroom. However, you may choose to participate in the class remotely.
* Students who cannot wear a face covering due to a medical condition or disability may seek accommodation through Disability Services (701-231-8463; https://www.ndsu.edu/disabilityservices/).
* Disinfecting supplies are provided for you to disinfect your learning space. You may also use your own disinfecting supplies.
* Students should observe social distancing guidelines whenever possible. Students should avoid congregating around instructional space entrances before or after class. Students should exit the instructional space immediately after the end of class to ensure social distancing and allow for the persons attending the next scheduled class to enter the classroom.
* In accordance with NDSU Policy 601, failure to comply with instructions, including this syllabus, may be handled according to the Code of Student Conduct resolution process and may result in disciplinary sanctions.
* No food and drink will be allowed in the class unless a student has a documented accommodation through Disability Services.

**Veteran Status and Student Service Members**

Veterans and student service members with special circumstances or who are activated are encouraged to notify Dr. Christensen as soon as possible and are encouraged to provide Activation Orders.

**Americans with Disabilities Act for Students with Special Needs**

Any students with disabilities or other special needs, who need special accommodations in this course, are invited to share these concerns or requests with Dr. Christensen and contact the [Disability Services Office (www.ndsu.edu/disabilityservices)](http://www.ndsu.edu/disabilityservices/) as soon as possible.

**Academic Honesty**

The academic community is operated on the basis of honesty, integrity, and fair play. [NDSU Policy 335: Code of Academic Responsibility and Conduct](http://www.ndsu.edu/fileadmin/policy/335.pdf) applies to cases in which cheating, plagiarism, or other academic misconduct have occurred in an instructional context. Students found guilty of academic misconduct are subject to penalties, up to and possibly including suspension and/or expulsion. Student academic misconduct records are maintained by the [Office of Registration and Records](http://www.ndsu.edu/registrar/). Informational resources about academic honesty for students can be found at [www.ndsu.edu/academichonesty](http://www.ndsu.edu/academichonesty).

**Additional Resources for Students**

As a member of the NDSU community, resources are available for you should you need help in dealing with adverse reactions to things happening in the world today. A variety of resources are listed below:

**For students on campus and remotely (telehealth):**

Counseling Services: 701-231-7671; https://www.ndsu.edu/counseling/

Disability Services: 701-231-8463; https://www.ndsu.edu/disabilityservices/

Student Health Service: 701-231-7331; https://www.ndsu.edu/studenthealthservice/

Dean of Students Office: 701-231-7701; <https://www.ndsu.edu/deanofstudents/>

**For tutoring and academic support:**

ACE Tutoring: 701.231.5554; <https://www.ndsu.edu/ace/>

TRIO Student Support Services: 701-231-8028; <https://www.ndsu.edu/triosss/about/>

I**n a crisis or emergency situation:**

Call University Police: 701-231-8998

Call 9-1-1

For physical health crises: Go to a Hospital Emergency Room

For mental health crises: Go to Prairie St. Johns for a Needs Assessment: 701-476-7216 (510 4th St. S.)

Call the FirstLink Help Line: 1-800-273- TALK (8255) or 2-1-1

Call Rape and Abuse Crisis Center: 701-293-7273

Week/Class Breakdown

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Date | Week | Class | Assigned | Returned | Notes |
|  | 0 | 0 |  |  |  |
| Aug 25 | 1 | 1 |  |  | Discuss non-quantum-content things about class.  |
| Aug 27 |  | 2 | **Quiz 1 on Syllabus**, Readings |  | Quiz during last 10 or 15 minutes |
| Sept 1 | 2 | 3 | Readings | Quiz 1 |  |
| Sept 3 |  | 4 | **Quiz 2**, Homework, and Readings |  |  |
| Sept 8 | 3 | 5 | Readings | Quiz 2 |  |
| Sept 10 |  | 6 | **Quiz 3**, Homework, and Readings |  |  |
| Sept 15 | 4 | 7 | Readings | Quiz 3 |  |
| Sept 17 |  | 8 | ***Test 1*** |  |  |
| Sept 22 | 5 | 9 | Readings | Test 1 | Prepare for Mastery Presentation |
| Sept 24 |  | 10 | **Quiz 4**, Homework, and Readings |  | Prepare for Mastery Presentation |
| Sept 29 | 6 | 11 | Readings | Quiz 4 | Mastery Presentation for Test 1 |
| Oct 1 |  | 12 | **Quiz 5**, Homework, and Readings |  | Mastery Presentation for Test 1 |
| Oct 6 | 7 | 13 | Readings | Quiz 5 |  |
| Oct 8 |  | 14 | **Quiz 6**, Homework, and Readings |  |  |
| Oct 13 | 8 | 15 | Readings | Quiz 6 |  |
| Oct 15 |  | 16 | ***Test 2***  |  |  |
| Oct 20 | 9 | 17 | Readings | Test 2 | Prepare for Mastery Presentation |
| Oct 22 |  | 18 | **Quiz 7**, Homework, and Readings |  | Prepare for Mastery Presentation |
| Oct 27 | 10 | 19 | Readings | Quiz 7 | Mastery Presentation for Test 2 |
| Oct 29 |  | 20 | **Quiz 8**, Homework, and Readings |  | Mastery Presentation for Test 2 |
| Nov 3 | 11 | 21 | Readings | Quiz 8 |  |
| Nov 5 |  | 22 | **Quiz 9**, Homework, and Readings |  |  |
| Nov 10 | 12 | 23 | Readings | Quiz 9 |  |
| Nov 12 |  | 24 | ***Test 3*** |  |  |
| Nov 17 | 13 | 25 | Readings | Test 3 | Prepare for Mastery Presentation |
| Nov 19 |  | 26 | **Quiz 10**, Homework,and Readings |  | Prepare for Mastery Presentation |
| Nov 24 | 14 | 27 | Readings | Quiz 10 | Mastery Presentation for Test 3 |
| Nov 26 |  |  | ***NO CLASS!*** |  | Mastery Presentation for Test 3 |
| Dec 1 |  | 28 | Readings |  |  |
| Dec 3 | 15 | 29 | Quiz 11, Homework  |  |  |
| Dec 8 |  | 30 |  | Quiz 11 |  |
| Dec 10 | 16 | 31 |  |  |  |
| Dec 14-18 |  |  | Final exam |  |  |