

# Physics 480 – Quantum Mechanics I – Syllabus<sup>1</sup>

Fall Semester 2021, University of Hawaii at Manoa  
Class: Mon, Wed, Fri 12:30 pm – 1:20 pm, in zoom

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Office Hours:	t.b.d. - poll	TA:	t.b.d.

## **Class will be in zoom**

### **Announcements, homework assignment, homework submission: in google classroom**

- Google classroom “Class code” – which you may need to join, is: *REDACTED*
- Zoom link which will be used for every class: *REDACTED*

## **Description in Course Catalog**

Wave mechanics, Schrodinger equation, angular momenta, potential problems.

## **Course Description**

Quantum mechanics (QM) got me excited about physics – and I hope to pass on this excitement to you. Quantum mechanics is required to understand phenomena at the atomic and sub-atomic scales, and thus is at the heart of modern physics.

QM can be mathematically and conceptually difficult. To become proficient requires solving sometimes time-consuming problems on your own, so expect to work hard. The intellectual rewards are, however, great. QM tends to lead to a number of interesting conceptual and philosophical questions. We will begin with the math and problem solving but stop once in a while to reflect on what it all means.

## **Recitations**

No recitations this semester.

## **Prerequisites**

Formal Prerequisites: Physics 274, 310, 350, and MATH 244 or MATH 253A; and MATH 311; or consent. Co-requisite: Physics 400. In practice, you need to be comfortable with linear algebra,

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<sup>1</sup> Version: 8/22/2021.

complex numbers, differential equations, and probability density functions. **Review Appendix A, B, C in the textbook!**

### **Required Materials**

Textbook: *Quantum Mechanics, A Paradigms Approach* by David H. McIntyre

### **Homework**

Weekly sets of written problems, and occasional reading assignments. (You'll benefit greatly from previewing topics in the book before my lectures and should make such pre-reading a habit.) Typically, written problems are due one week after assignment. Honest collaboration is encouraged, but the **material handed in must be your own work. Utilizing homework solutions found on the web will be considered cheating and will be reported.**

### **Learning Goals**

- You should understand and will be tested on all *material presented in class and/or covered in homeworks*. (You don't have to know everything in the book.)
- You should be able to independently solve problems of the same difficulty level as the homework.
- The end-of-chapter summaries in the book provide a good overview of the major concepts.

### **Evaluation (this may be revised – preliminary plan)**

Initial assessment tests	(0%)
Homework	(25%)
Midterm I (probably take-home)	(35%) [date t.b.d.]
Midterm II (probably take-home)	(35%) [date: t.b.d.]
Final exam (no final during pandemic)	
Class participation and quizzes	(5%)

### **Office hours**

I want to get to know you, and help you succeed in the class. I strongly encourage you to come to office hours. These will be held online via zoom. These will be scheduled at the optimal time, as determined by the poll. **If you have physics questions, do not ask them via email. Come to office hours to discuss instead. Physics via email is highly inefficient.**

### **Course Outline**

This course is part of a 1-year sequence (Physics 480 and 481) that will cover most of the material in the textbook by McIntyre. I plan to cover chapters 1 through 8 in 480, nominally using the schedule shown on page xvii in the preface of the textbook, but I will adjust the pace as needed. When I teach Phys 481, I tend to substitute scattering and some particle physics for chapters 15 and 16 and will use Griffiths in addition to McIntyre.