

Physics 480 – Quantum Mechanics I – Syllabus¹

Fall Semester 2020, University of Hawaii at Manoa
Class: Mon, Wed, Fri 12:30 pm – 1:20 pm, Watanabe Hall 114

Instructor:	Prof. Sven E. Vahsen	Phone:	(808) 956 2985
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Class will be in zoom

Announcements, homework assignment, homework submission: in google classroom

- Google classroom “Class code” – which you may need to join, is: ---removed---
- Zoom link which will be used for every class: ---removed from this public version---

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.

¹ Version: 8/24/2020.

Prerequisites

Prerequisites: Physics 274, 310, 350, and MATH 244 or MATH 253A; and MATH 311; or consent.
Co-requisite: Physics 400.

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)

Homework	(15%)
Two midterm Exams	(20% each, 40% total)
Final Exam	(35%) (cumulative, but emphasis on last 3 rd of class)
class participation, quizzes	(10%)

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.