

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

Fall Semester 2019, University of Hawaii at Manoa  
Class: Mon, Wed, Fri 12:30 pm – 1:20 pm, Watanabe Hall 114  
Mandatory Recitation: Friday 10:00 am

Instructor:	Prof. Sven E. Vahsen	Phone:	(808) 956 2985
Office:	Watanabe Hall 227A	E-mail:	<a href="mailto:sevahsen@hawaii.edu">sevahsen@hawaii.edu</a>
Office Hours:	Friday, 2:00-3:00 pm	TA:	Jeffrey Schueler, <a href="mailto:jschuel@hawaii.edu">jschuel@hawaii.edu</a>

## **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 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**

The mandatory recitations, led by Jeff, will start in the 2<sup>nd</sup> week of classes, at an optimal time as determined by a poll. Some weeks there will be guided (homework) problem solving sessions. Other weeks you will be using computer simulations to probe and visualize quantum systems.

## **Prerequisites**

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

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<sup>1</sup> Version: 9/10/2019.

## 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, though the overlap is large.)
- 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

Homework	(15%)
Two midterm Exams	(20% each, 40% total)
Final Exam	(35%) (cumulative, but emphasis on last 3 <sup>rd</sup> of class)
Recitation attendance, class participation, pop 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 scheduled at the optimal time, as determined by the poll for possible recitation times. **If you have physics questions, do not ask them via email. Come to my office 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.