

Physics 480 – Quantum Mechanics I – Syllabus¹

Fall Semester 2017, University of Hawaii at Manoa

Class meets Mon, Wed, Fri 12:30 pm – 1:20 pm, Watanabe Hall 114

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Office Hours: Tuesdays 9:30 – 11:00

Description in Course Catalog

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

Course Description

Quantum mechanics 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 scale, and thus is at the heart of modern physics. Although I will do my best to elucidate the material, be warned that Quantum Mechanics can be both mathematically and conceptually difficult. The only way to become proficient is by solving a large number of problems, so expect to work hard. The intellectual rewards are however great. Quantum Mechanics tends to lead to a number of 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. We will occasionally use computer simulations to visualize quantum systems.

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, written problems and reading. Typically, due one week after assignment. Honest collaboration is encouraged, but the **material handed in must be your own work.**

¹ Version: 9/12/2017.

Learning Goals

You don't need to know all that's in the book. You should understand and will be tested on all material presented in class and/or covered in homeworks. You should be able to independently solve problems of the same difficulty level as the homework.

Evaluation

Class participation	(10%)
Homework & reading	(15%)
Two midterm Exams	(2×20%=40%) (each covering about 1/3 rd of material)
Final Exam	(35%) (cumulative, but emphasis on last 3 rd of course)

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. I also expect to substitute scattering and some particle physics for chapters 15 and 16 in Physics 481.