

Physics 448

Quantum Mechanics II

Spring

2019

Course description: A continuation of the study of quantum mechanics including quantum statistical mechanics, time-independent and time-dependent perturbation theory, and scattering. Prerequisites: PHYS 447. Offered in the Spring semester of even numbered years. One semester; three credits

Text: David J. Griffiths, Darrell F. Schroeter, *Introduction to Quantum Mechanics*, Third Edition, Cambridge University Press, One Liberty Plaza, 20th Floor, New York, NY 10006, 2018.

Instructor: Ted Clarke
tclarke2@cbu.edu

Office: Cooper-Wilson 115. Office hours will be announced in class.

Course objectives: This second course will build on the knowledge and problem solving techniques that were introduced in Quantum I. We will analyze more complicated quantum phenomena with advanced techniques and explore modern applications of quantum theory.

Course content: Time Independent Perturbation Theory
Perturbed Eigenstates.
Stark Effect

Hydrogen Atom
Relativistic Effects
Spin-Orbit Coupling
Hyperfine Structure

Many Particle Systems
Two Particle System
Identical Particles
Exclusion

Time Dependent Perturbation
Phase Space

Charged Particles in an Electromagnetic Field

Radiative Decays

Collision Theory
Scattering
Born Approximation

Grading:	Mid-Term Exam	20%
	Final Exam	20%
	Homework	50%
	Research Project	10%

0-59 F 60-69 D 70-79 C 80-89 B 90-100 A

No make-up exams will be given without a verifiable medical excuse.

Late homework will be accepted at $\frac{1}{2}$ credit until the last day of class.

Late exams will not be accepted.

As a responsible student, you are expected to attend class.

I reserve the right to modify this syllabus as the course develops.

Ted Clarke