

PHY 6730 Quantum Mechanics Fall 2020

MSC384 or Online

Tuesday, Thursday 3:00-4:47 pm

(Please stay tuned)

Instructor: Wei Zhang, Ph.D.

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Office hours: by appointment and online

Email is a very reliable way to communicate with me, as well as the likely way that I will use to communicate with the class. It is good to get in the habit of checking your email on a regular basis, if you don't already do so.

Textbook: **No Textbook required.** I will be using my own developed materials. Useful reference books, in which my materials are partly developed from, include:

R. Shankar, "Principle of Quantum Mechanics", 2nd Ed.

J. J. Sakurai, "Modern Quantum Mechanics", Revised Ed.

Topics: The course will cover **five** main panels, and hopefully we can finish them all.

Panel 1: Brief review of fundamental concepts, mathematical foundations for advanced QM, experimental basis of QM.

Panel 2: Quantum dynamics, time evolution, harmonic oscillator, the Schrodinger vs. Heisenberg picture.

Panel 3: Degrees of freedom, angular momentum, addition of angular momentum, Clebsch–Gordan coefficients, kinematics and dynamics of spin.

Panel 4: Identical particles, symmetry in QM, discrete-symmetry examples, perturbation theory.

Panel 5: Quantum entanglement, spin correlation, quantum information science.

Homework: 4 Homeworks in total (Panel 1 – 4). Due at the end of each panel.

Grading policy:

- Homeworks (40%): homework is due in class, and late homework will not be accepted. If class is online, it is due by email before the class meet time.
- Tests (30%): two take-home tests, each worth 15% of grade. Currently scheduled on:

Thursday, October 8th (24-hour online submission)

Thursday, November 12th (24-hour online submission)

- Final report (30%): due on:

Thursday, December 10th

(Please stay tuned)

The relation between the overall percentage and the grade is as follows:

50% -- 1.0, 60% -- 2.0, 75% -- 3.0, 95% -- 4.0

Letter Grade	4.0 Scale	Percent Scale	Letter Grade	4.0 Scale	Percent Scale
A	4.0	95 – 100	C+	2.3 – 2.6	65 – 69
A-	3.7 – 3.9	88 – 94	C	2.0 – 2.2	60 – 64
B+	3.3 – 3.6	81 – 87	C-	1.7 – 1.9	57 – 59
B	3.0 – 3.2	75 – 80	D+	1.3 – 1.6	53 – 56
B-	2.7 – 2.9	70 – 74	D	1.0 – 1.2	50 – 52
			F	0.0	<50

Schedule (Fall 2020):

		Tuesday		Thursday
Week 1			3 _{Sept}	Course Introduction
Week 2	8	Begin Panel 1	10	
Week 3	15		17	Panel 1 HW Due
Week 4	22	Begin Panel 2	24	
Week 5	29		1 _{Oct}	
Week 6	6	Panel 2 HW Due	8	1 st TEST
Week 7	13	Begin Panel 3	15	
Week 8	20		22	
Week 9	27	Panel 3 HW Due	29	Begin Panel 4
Week 10	3 _{Nov}		5	
Week 11	10	Panel 4 HW Due	12	2 nd TEST
Week 12	17	Begin Panel 5	19	
Week 13	24		26	Thanks-giving
Week 14	1 _{Dec}		3	Class review
Week 15	8	Study day	10	Final report due

COVID-19 disclaimer: due to the ever-changing COVID-19 situation, please **stay tuned on email** for any changes and updates regarding the class, including but not limited to, the delivering format and the course schedule.