PHYC 522, SPRING 2012

GENERAL INFORMATION

Instructor: Dr. Huaiyu "Mike" Duan, duan@unm.edu, P&A 1144, 505-277-1508
TA: Sajad Abbar, sabbar@unm.edu, P&A 1149
Class schedule: 9:00 -- 10:15 PM on Wednesday and Friday, P&A 5
Problem session (PHYC551.058): 6:30 -- 8:30 PM on Wednesday, P&A 5.
Instructor's office hour: 9:30-11:30 PM on Thursday or by appointment, P&A 1144
Make sure you can receive emails from your UNM email address *every weekday*.
This course is administered through WebCT (http://vista.unm.edu/webct). Lecture notes, calendar, home assignments, exams and solutions will all be posted in WebCT.

TEXTBOOK AND LECTURE NOTES

We will use *Modern Quantum Mechanics* by Sakurai and Napolitano (2nd edition, published by Addison Wesley, ISBN 978-0-8053-8291-4) as the main textbook.
Skeleton lecture notes and supplementary materials will be distributed through WebCT.
A couple of reference books that you may find useful:

- ★ *Quantum Mechanics , vol. I&II,* by C. Cohen-Tannoudji, B. Diu, and F. Laloë.
- ★ *Principles of Quantum Mechanics* by R. Shankar.

HOMEWORK, PROBLEM SESSIONS, EXAMS AND GRADES

There will be one home assignment (almost) each week. Home assignments are due at the beginning of the problem sessions unless otherwise stated. Your grade for homework = (sum of all your homework scores)/(maximum total homework score) × (120/100). There will be **NO MAKEUP ASSIGNMENT**, and **NO LATE ASSIGNMENT** is accepted. The solution for each assignment is posted in WebCT on the due date of the assignment. *The grades of home assignments are not curved*.
There will be **four equally weighted exams**. The first three exams will be held during problem sessions. The date of the last exam will be decided later. The exams are strictly **CLOSED-BOOK**, i.e. not even with cheat sheet or calculator. *The grades of each exam are curved*.
*You **should** register for one hour of credit in the problem session*. Home assignments will be distributed during the problem sessions as well as through WebCT. During a problem session you will work on one of the homework problems by groups of 3 or 4. To prepare you for the exams, *the problem sessions will also be closed-book*.
Your final score = (homework grade)×40% + (exam 1)×15% + (exam 2)×15% + (exam 3)×15% + (exam 4)×15% .
The scales for letter grades are: A+ (≥100), A (95–99), A- (90–94), B+ (85–89), B (80–84), B- (75–79), C+ (70–74), C (65–69), C- (60–64), F (≤59).
You will receive *Credit* for the problem session as long as you register and show up for more than 60% of the time.

TOPICS AND PREREQUISITES

The main objective of *Quantum Mechanics II* is to gain the capability to apply quantum mechanics to some real physics problems. Because most physics problems cannot be solved exactly, we will learn how to calculate with various approximation methods. We will learn how to deal with one of the common scenarios in physics, the scattering between particles. We will also briefly cover some of the more advanced topics such as identical particles and relativistic quantum mechanics.
This course assume that you have a solid understanding of graduate *Quantum Mechanics I*, undergraduate *Classical Mechanics, Quantum Mechanics and E&M*, and *(Mathematical) Methods of Theoretical Physics*.

SCHEDULE

Below is a **TENTATIVE** schedule for this semester. Look at the **CALENDAR** in WebCT for the actual schedule.

WEEK	LEC	DATE	TOPIC	BOOK	HW DUE
1	1	1/18	Fundamental concepts	Chap 1,2	
	2	1/20			
2	3	1/25	Theory of angular momentum	Chap 3	
	4	**1/27**			
3	5	2/1			
	6	**2/3**	Symmetry in quantum mechanics	Chap 4	
4	7	2/8	**EXAM I**		
		2/10			
5		2/15			
	8	2/17	Approximation methods	Chap 5	
6	9	2/22			
	10	2/24			
7	11	2/29			
	12	3/2			
8	13	3/7	**EXAM II**		
		3/9			
9	14	3/14	**SPRING BREAK**		
	15	3/16	**SPRING BREAK**		
10	16	3/21			
		3/23			
11		3/28			
	17	3/30	Scattering theory	Chap 6	

WEEK	LEC	DATE	TOPIC	BOOK	HW DUE
12	18	4/4			
	19	4/6			
13	20	4/11	**EXAM III**		
	21	**4/13**			
14	22	4/18			
		4/20			
15	23	4/25	Identical particles	Chap 7	
	24	4/27			
16		5/2	Relativistic quantum mechanics	Chap 8	
		5/4			
17			**EXAM IV**		

Important Deadlines:

1/27 Last day to add courses or change sections

2/3 Last day to drop a course without a grade

2/10 Last day to change grading options

4/13 Last day to withdraw without approval of college dean

5/4 Last day to withdraw from a course with approval of college dean