PHY 6645: Introduction to Quantum Mechanics 1, Fall 2021

Meetings: MWF 10:40 am - 11:30 am (period 4), at NPB 1101

Instructor: Khandker Muttalib; NPB 2140; Tel: 392-6699; Email:muttalib@phys.ufl.edu

Office Hours: (Tentative) MWF 9:35 am-10:25 am (period 3) at NPB 2140, or by appointment. To make an appointment, please send an email.

Grader: To be announced.

Textbook (Required): "Principles of Quantum Mechanics" by Ramamurti Shankar, 2d edition, Springer 1994. We will cover chapters 3 - 12.

Other good books:

- L. Landau and E. Lifchitz, `Quantum Mechanics', Pergamon Press.
- L.I. Schiff, `Quantum Mechanics', 3d Edition, McGraw-Hill 1968.
- E. Merzbacher, `Quantum Mechanics', 2d Edition, Wiley 1970.
- J.J. Sakurai and J. Napolitano, `Modern Quantum Mechanics', 2d Edition, Cambridge University Press 2017.

Homework and grading: There will be regular homework assignments, please see the list in HW Problems. (For medical or other excused absences, see me for approval to submit late.) There will also be three in-class, closed-book exams. The total grade will derive 40% from homework and 60% from the three exams.

Expectations: You are expected not to copy any homework solution from anyone else, and not to ask for help until you have tried hard to do it all by yourself. If you fail to do after sincere efforts, you are *encouraged* to get help from fellow class friends, instructor, or anyone else. You are also encouraged to form small study groups and discuss homework assignments, within the above rule. I expect *each* of you to submit *all* homework assignments; they are an integral part of the course. If for any reason you miss an assignment, see me immediately for approval to submit late with partial credit. The course will cover a lot of material, and you should be prepared to invest a substantial amount of time.

Instructional methods: The syllabus, lecture schedule, homework problems, lecture notes, grades and all announcements will be posted on Canvas.

Class attendance and make-ups: Requirements for class attendance, make-up exams, and other work in this course are consistent with university policies that can be found at https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx.

Exams: There will be three during-term exams (see Lecture Schedule posted separately) which are closed-book and closed-note, but all essential formulae will be given.

Outline (Tentative):

8/23 – 9/27: Linear vector spaces, operators, the eigenvalue problem, propagators, postulates, Schrodinger equation.

9/29: Exam 1

10/01 – 10/25: Scattering in 1D, tunneling, harmonic oscillator.

10/27: Exam 2

10/29 – 12/06: Path integral formulation, uncertainty relations, systems with N degrees of freedom, symmetries and consequences, angular momentum and rotationally invariant problems.

12/06: Exam 3

Grading scale: The final letter grades will be assigned according to the following criteria:

A: $\geq$ 90 %
A–: 85 – 89 %
B+: 80 – 84 %
B: 70 – 79 %
B–: 65 – 69 %
C+: 60 – 64 %
C: 50 – 59 %
C–: 45 – 49 %
D+: 40 – 44 %
D: 35 – 39 %
D –: 30 – 34%
E: $\leq$ 29 %

For current UF grading policies for assigning grade points, see
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx

Academic Honesty: All University of Florida students are required to abide by the University's Academic Honesty Guidelines and by the Honor Code, which reads as follows:

We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity. On all work submitted for credit by students at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

Cheating, plagiarism, or other violations of the Academic Honesty Guidelines will not be tolerated and will be pursued through the University's adjudication procedures.

Special Accommodations: Students with disabilities requesting accommodations should first register with the Disability Resource Center (352-392-8565, http://www.dso.ufl.edu/drc/) by providing appropriate documentation. Once registered, students will receive an accommodation letter which must be presented to the instructor when requesting accommodation. Students with disabilities should follow this procedure as early as possible in the semester.

Student Privacy: There are federal laws protecting your privacy with regards to grades earned in courses and on individual assignments. For more information, please see the Notification to Students of FERPA Rights.

Course evaluation: "Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online via GatorEvals. Guidance on how to give feedback in a professional and respectful manner is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens and can complete evaluations through the email they receive from GatorEvals, in their Canvas course menu under GatorEvals, or via https://ufl.bluera.com/ufl/. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/."

Campus Resources:

Health and Wellness:

U Matter, We Care: If you or a friend is in distress, please contact umatter@ufl.edu or 352 392-1575 so that a team member can reach out to the student.

Counseling and Wellness Center: counseling.ufl.edu/cwc, and 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

Sexual Assault Recovery Services (SARS): Student Health Care Center, 392-1161.

University Police Department: at 392-1111 (or 9-1-1 for emergencies), or police.ufl.edu.

Academic Resources:

Career Resource Center: Reitz Union, 392-1601. Career assistance and counseling.

Teaching Center: Broward Hall, 392-2010 or 392-6420. General study skills and tutoring.

Writing Studio: 302 Tigert Hall, 846-1138. Help brainstorming, formatting, and writing papers.

Diversity: Physics is practiced and advanced by a scientific community of individuals with diverse backgrounds and identities and is open and welcoming to everyone. We recognize the value in diversity, equity and inclusion in all aspects of this course. This includes, but is not limited to differences in race, ethnicity, gender identity, gender expression, sexual orientation, age, socioeconomic status, religion and disability. All members of this class are expected to contribute to a respectful, welcoming, and inclusive environment for every other member of the class.

Recordings: Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

Updates: As the course progresses, the syllabus may need updating in order to enhance the learning opportunity. Any such changes will be announced in class.