

Quantum Mechanics II : Phys 712

1 Course Outline:

Course: Quantum Mechanics II- Phys 712

Instructor: Dr Alakabha Datta

Office: 209 Lewis Hall

Meeting: MWF 9.00 am to 9.50 am at Lewis 104

Office Hours: By Appointment

Email: datta@olemiss.edu, datta@phy.olemiss.edu

Phone: (662) 915-5611

Course homepage: Check Blackboard.

2 Book

- Book : Modern Quantum Mechanics Third Edition J.J. Sakurai and Jim Napolitano

2.1 Reference Books

- Quantum Mechanics by E. Merzbacher.
- Principles of Quantum Mechanics by R. Shankar.
- Introduction to Quantum Mechanics by David J Griffiths.
- Quantum Mechanics by L. Schiff.
- Quantum Mechanics by Claude Cohen Tannoudji.
- Quantum Mechanics by David H. McIntyre.
- Quantum Mechanics with Basic Field Theory by Bipin R. Desai.

Course Goals: Learning to apply the basic postulates and rules of Quantum Mechanics learnt in QM 711 to solve problems in various areas of research.

Independent study: The course will also involve solving problems that will require students to research material on published journals to complete the project. The purpose of this is to help the student acquire skills to pursue independent research. The students will also complete a report on a topic of current research interest

3 Topics Covered will be taken from the list below:

- Potentials and the E & M fields. Density matrix, Tensor operators.
- Symmetries: Parity, Lattice and Time reversal transformation.

- Time independent Perturbation Theory: Stark Effect, spin-orbit and Zeeman effect.
- Relativistic corrections. Lenard Jones potentials.
- Time dependent problems: Dyson Series, Dipole atomic transitions, Photoelectric effect.
- Identical particles and many particle system.
- Scattering
- Dirac Equation.

4 Marking

- Homework: 55 % .
- Mid Term Report: 20%.
- Final Take Home Exam: 25% .

An overall course average of the following percentages will guarantee the corresponding letter grade:

90%	A
80%	B
70%	C
60%	D

Attendance: There is no attendance requirement. However, if you miss an exam or cannot turn in HW on time because of illness I will require a doctor's note. If you will away on other reasons inform me prior to your absence and get a note if applicable. I might take random roll-call and give extra credits to students who have good attendance.

5 Academic Integrity:

We will follow the University policy of academic integrity (M-book). Violations of these policies will result in a failing grade and other disciplinary actions.