Syllabus: Physics 451

Quantum Mechanics

This is a detailed quantum mechanics course for physics majors, one of the four most important subjects a physicist must learn. Equal emphasis is placed on understanding the logic behind the theory and problem solving.

Lecture

Lewis 228, Monday and Wednesday, 11:00-12:15

Instructor

Dr. Tibor Torma, Department of Physics and Astronomy,
Lewis 208 (Kennon 1 temporarily), 832-5627, ttorma@phy.olemiss.edu.

Office Hours

After each class, or call for appointment.

Credit

3 credit hours.

Textbook

David J. Griffiths: *Introduction to Quantum Mecahnics*, 2nd edition.

(Each student is requested to buy his/her own paper copy.)

Coverage:

(Not in this order!)

1. Blackbody radiation, 2. All of Part I in the textbook (Basic quantum mechanics), 3. Appendix A in the textbook (Linear algebra), 4. Canonical quantization, 5. Time-dependent perturbation theory

Lectures: Attendance is mandatory. In case a student cannot make it to a class, he must notify (call) the instructor. In such case the class will be canceled and made up at a later time.

Discipline: Late arrivals are not tolerated. Credit-bearing quizzes are given promptly in the beginning of each class.

Homework: Two types of homework are assigned: 1. Short explanations of issues discussed in the class (always due next class); 2. Full sets of problems or mini-research (always due by the next Tuesday class). Homework problems require a format where all formulas are placed inside sentences that introduce the logical step the formulas represent. (For an example of the expected format, consult, e.g., Example 4.2 on p.178 of the textbook.) Homework that does not follow this format will carry very little credit.

Comment on homework: All homework must be individual work; cooperation between students is **not** permitted. The use of the internet is also **not** allowed. The purpose of homework is to develop the

understanding and calculational skills of the students. Breaking the above rules is strongly counterproductive (and there is the risk of being caught, too).

Quizzes: In the beginning of each class, a five-minute quiz will be given. In these quizzes, students will be requested to write down a law of nature or an important logical step taken, or else to answer simple questions, usually with one-line answers. Students should prepare for these quizzes by reviewing the previous class' material, understand and memorize the main steps.

Tests: *(The timing of the test will be subject to change with the agreement of each person involved.)*

- Three 1^h15^m tests are given during the semester, on **Sept. 18 (Monday)**, **Oct. 16 (Monday)**, and **Nov. 13** (**Monday),** during class time.
- The three-hour final exam during the week of **Dec 4-8** is comprehensive. The day and time will be determined by the University (TBA). Note that the instructor does **not have the right** to give the final exam at a different time, so make sure you do not reserve an early flight ticket!

Tests are all closed book. The use of a calculator will be necessary. Tests are, in equal measure, based on reproducing the logic followed in class and on problem solving, following the pattern of the homework and the quizzes.

Students with disabilities: All reasonable measures will be taken to accommodate any special needs individually; please inform the instructor in a timely fashion.

Late enrollment: Students who do not attend the first week but enroll later will have to make up all that they missed within one week.

Grading: The grades are determined by the weighted average as follows:

A≥92%>A⁻≥ 90%>B⁺≥88%>B≥82%>B⁻≥80%
80%>C⁺≥78%>C≥72%>C⁻≥70%>D≥60%>F
Homework: 15%
Quizzes: 10%
Three tests 16.67% each
Final 25%