PHYSICS 402 COURSE DESCRIPTION Spring 2018

DESCRIPTION:

Physics 402: Quantum Physics II: Quantum states as vectors; spin and spectroscopy, multiparticle systems, the periodic table, perturbation theory, band structure, etc. The second semester of the two-term sequence on introduction to quantum physics for physics majors. *This is a 4-credit course.*

PREREQUISITE:

PHYS 401, and PHYS 274, or MATH 240. A good working knowledge of linear algebra and differential equations is important.

LECTURES:

Monday, Wednesday, Friday 9:00-9:50 AM; Toll 1201
Wednesday Discussion 10:00-10:50am; Toll 1201

INSTRUCTOR:

Prof. Alberto Belloni
301-405-6058
PSC 3208F
abelloni@umd.edu

TEXT AND REFERENCES:

- D. Griffiths, "Introduction to Quantum Mechanics 2nd Ed.", ISBN: 0-13-111892-7
- K. Krane, "Modern Physics 2nd Ed.", ISBN: 0-471-82872-6
- R. L. Liboff, "Introductory Quantum Mechanics 4th Ed.", ISBN: 978-0805387148

COURSE WEB SITE:

http://www.physics.umd.edu/courses/Phys402/abelloni-S18

LECTURES:

You will be responsible for material presented in lecture that is not in the book. If you miss a lecture you are responsible for finding out from a classmate what we did in class.

OFFICE HOURS:

You are very strongly encouraged to attend office hours to ask questions, discuss the homework problems, and talk about physics in general. The office hours will be held 3:00-4:30 PM on Thursdays, just before the homework is due. Please contact me to set appointments outside the normal office hours.

HOMEWORK:

The homework assignments will be given on the class website. The assignment will be due at the beginning of class on Fridays. *Please staple papers and show your name, assignment number and date due.* Two homework problems will be graded quantitatively (0-10) and the rest will be graded qualitatively (0-2). The choice of the two problems to grade quantitatively will be made after the homework is collected. Doing the homework is a very important part of this course! Homework will be returned by the following week. Late homework will not be accepted. As compensation, the lowest homework grade from the semester will be dropped.

EXAMS:

There will be two “mid-term” exams and a final exam. All exams will be counted towards your final grade. Make-up exams (for any of the exams) must be requested well in advance of the exam; the reason for the absence must be documented and in accord with University policy (see p. 33 of this document). If an exam is unexpectedly canceled (due to inclement weather, etc.) it is automatically rescheduled for the next class period. In grading, we are looking more at the reasoning that you use, rather than the final number you arrive at. So remember to carefully set up the problem on paper, even if you cannot see the way through to the solution. The final exam is (to be confirmed!) *Wednesday, May 16, from 8 to 10 AM.*

COMPUTERS:

Developing a working knowledge of computers in the context of physics problem solving is an important skill. You are encouraged to solve problems using programs such as Mathematica. Note that a student version of Mathematica is available for download from TERPware: http://terpware.umd.edu/Windows/Title/1837.

IMPORTANT DATES:

First meeting: January 24
Spring Break: March 18-25
Last day to drop with a "W": April 11
Last day of Classes: May 10
Final exam: May 16

FINAL GRADE:

Homework	30%
Midterms	40%

Final	30%

ACADEMIC DISHONESTY (CHEATING):

Academic dishonesty is a serious offense that can result in suspension or expulsion from the university. In addition to any other action taken, the normal sanction is a grade of "XF", denoting "failure due to academic dishonesty," and will normally be recorded on the transcript of the offending student. Students are required to perform all experiments, analysis, and write-ups independently. The experiments may be discussed with other students, but each student must work independently.

TIPS FOR DOING WELL:

1. Read the assignment in the book before and after the material is covered in lecture.
2. Freely ask questions in lecture, after lecture, and during office hours. Also discuss problems with your friends and classmates.
3. Work all of the homework questions and problems. You are allowed and encouraged to discuss homework with anyone you wish. However, in order to really learn, don't just copy solutions from somewhere or someone else; rather, work through them in detail yourself. Afterwards, make use of the solution sets, your TA's office hours, and me to make certain you understand all of the solutions. The exams will sometimes involve homework problems.
4. Seek help immediately if you do not understand the material or can't solve the problems. Help is available from your TA, and from me. Don't wait until just before the exams! If you are experiencing difficulties in keeping up with the academic demands of this course, contact the Learning Assistance Service. Their educational counselors can help with time management, reading, notetaking and exam preparation skills.
5. Remember that you are responsible for material discussed in class, even if it does not appear in the textbook.

PHYSICS GRE:

There is an emphasis on both historical aspects of quantum physics, as well as many general concepts from one-dimensional quantum mechanics on the Physics GRE exam. The textbook by Krane will be of great help in preparing for the historical aspects, while Griffiths is ideal for the analytical part of the exam. The more practice you have solving problems in quantum mechanics, the better you will do on the Physics GRE.

CourseEvalUM SPRING 2018:

Participation in the evaluation of courses through CourseEvalUM is a student responsibility held as a member of our academic community. Feedback is confidential and important to the improvement of teaching and learning at the University as well as to the tenure and promotion process. CourseEvalUM will be open for students to complete evaluations for spring semester courses starting about two weeks before the last day of classes. Go directly to the website CourseEvalUM to complete the evaluations. Completing all evaluations each semester gives online access at Testudo to the reports of the thousands of courses for which 70% or more students submitted their evaluations.