

SYLLABUS

Time: Mon./Wed. 5:30-6:45 pm
Location: PS F462
Instructor: Prof. Dmitry Matyushov
Office: PS F348
Phone: (480)9650057
E-mail: dmitrym@asu.edu
Office hours: Mon. 3-5 pm, Wed. 2 - 3:30 pm, or by e-mail appointment

Text: Quantum Physics (3rd edition),
by Stephen Gasiorowicz

Web page: <http://theochemlab.asu.edu/teaching/phy571/phy571.html>

Additional Text: "Applied Quantum Mechanics"
by Walter A. Harrison (World Scientific, 2000)

GRADING:

Homework: Five homework assignments will be given during the semester. **Each of homework assignments must be turned in at the beginning of the class on the due date (see the class web site for the dates).** The homework assignments will make 50 % of the grade.

Mid-term exam: A one-hour mid-term exam (open-book and open-notes, 25 % of the grade).

Final exam: A cumulative exam (open-book and open-notes, 25 % of the grade, Dec. 15, 4:50–6:40 pm).

ABSTRACT:

This course is for several sets of students, including Physics, Astronomy, Chemistry/Biochemistry, Electrical Engineering, Materials Science and Engineering students, and can take its character to some extent from those who join the course. It is a core course for the new Professional Science Masters' degree in Nanoscience. It may also interest other graduate students across Science and Engineering disciplines. It can be taken as a 'final' course in Quantum Physics, or in preparation for the PHY 576-577 course Quantum Theory series in the following year. For EEE students, it is a complementary or parallel course to EEE 434/591.

LIST OF MODULES:

1. Background information (Chs. 1-2)
2. 1-dimensional Eigenvalue problems (Chs. 3-4)
3. Operator and Matrix methods (Chs. 6-9)
4. Atomic and Molecular Physics: Spin and Statistics (Chs. 10-14)
5. QM in Biology, Chemistry, and Nanoscience:
QM in Chemistry: molecular absorption and emission
QM in biology: electron transfer, energy transfer, light harvesting
QM in nanoscience: quantum dots