Instructor Information
Instructor: De-Tong Jiang
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Lectures
Tuesday and Thursday 10:00 am - 11:20 am
MacN 318 (except the 1st lecture which is still in MINS, Room 017)

Calendar Description
The application of quantum theory to atomic and molecular structure, and the interaction between electromagnetic radiation and atoms and simple molecules.

Prerequisites
PHYS*4040 (Quantum Mechanics II)

Evaluation

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Assignment deadlines will be enforced with a late penalty of 10% per day.

Midterm Examination
Tuesday, October 17th, 7:00 pm to 9:00 pm. Room TBA

Final Examination
Saturday, December 9th, 8:30 am to 10:30 am. Room TBA

Text
References
Familiarity with a quantum text of your choice is essential. Griffiths’ “Quantum Mechanics” covers some of the material in this course. Gerhard Herberg’s “Atomic spectra and atomic structure” and “Molecular spectra and molecular structure, Vol 1” are gold mines of experimental information with wonderful qualitative discussions.

Outline

Part 1: Atoms (~70%)
   i. Overview of atomic structure: Interaction and energy scales, qualitative effect of spin, Pauli principle. Some spectroscopic notation.
   ii. Central forces and Angular momentum: Commutator relations, ladder operators, review of hydrogen atom solutions, spherical harmonics, spin angular momentum, addition of angular momentum.
   iv. Fine structure (spin-orbit coupling), hyperfine structure (nuclear spin and shape effects).
   v. External perturbations: Zeeman and Stark effects.

Part 2: Molecules (~30%)

Consideration for Illness, etc.
If you request academic consideration due to illness of a physical, psychological or emotional nature, or due to compassionate reasons, you may be required to provide suitable documentation (e.g., a medical certificate from a physician) at the discretion of the lecturer. See the Undergraduate Calendar for details.

Getting Help:
No fixed office hours set at this time, however, should it become necessary, I will inform you of these hours in class or via the course D2L site. You’re encouraged to drop by my office anytime during the day to look for help or make an appointment to see me.
Collaboration versus Copying

Students are encouraged to discuss with each other during working on the problem assignments. However, the work that you submit as your assignment must not be a copy of someone else’s work. Identical scripts will be given a mark of zero and plagiarism will be dealt with severely. Proper citations should be provided when books and other articles are used in your works.

Course Assessment

The Department of Physics requires student assessment of all courses taught by the Department. These assessments provide essential feedback to faculty on their teaching by identifying both strength and possible areas of improvement. In addition, annual student assessment of teaching provides part of the information used by the Department Tenure and Promotion Committee in evaluating the faculty member’s contribution in the area of teaching. The Department’s teaching evaluation questionnaire invites student response both through numerically quantifiable data, and written student comments. In conformity with University of Guelph Faculty Policy, the Department Tenure and Promotion Committee only considers comments signed by students (choosing “I agree” in question 14). Your instructor will see all signed and unsigned comments after final grades are submitted. Written student comments may also be used in support of a nomination for internal and external teaching awards.