

**PHYS-4710: QUANTUM MECHANICS II**  
**Syllabus, Spring 2019**

***Instructor***

Oscar Varela

SER 238

[oscar.varela@usu.edu](mailto:oscar.varela@usu.edu)

***Teaching Assistant***

Kenneth Zia

Kennethzia@gmail.com

***Meeting:*** Tue—Thu 12.00-1.15pm, in SER 122.

***Office hours:*** Tue, Thu 3.00-4.00, or by appointment.

***Recitations:*** TBD.

***Course description***

Foundations and applications of Quantum Physics. Survey of the basics of quantum physics and its applications to the theory of particles, atoms, molecules and solids. Problem solving techniques based on perturbative methods will be developed.

Subjects covered include:

- Indistinguishability of quantum mechanical particles.
- Quantum statistics
- Time-(in)dependent perturbation theory and applications
- Variational principle and the ground state of Helium
- The WKB approximation

***Goals***

- Become familiar with the basics of quantum physics.
- Be able to compute probabilities for processes and transitions using quantum mechanical prescriptions.
- Understand the basics of perturbative methods in physics.

***Text***

The course will be based on the following textbook:

- D.J. Griffiths, *Introduction to Quantum Mechanics*, second edition, Cambridge University Press, 2017.

Another useful book of a similar level is:

- R. Eisberg, R. Resnick, *Quantum Physics of atoms, molecules, solids, nuclei and particles*, second edition, John Wiley & Sons, 1985.

More advanced texts include:

- J.J. Sakurai, *Modern Quantum Mechanics*, revised edition, Addison Wesley, 1993.
- S. Weinberg, *Lectures on Quantum Mechanics*, second edition, Cambridge University Press, 2015.

### ***Homework***

Homework sets will be posted on Canvas every two weeks. Homework will be due one week after it is posted.

### ***Exams***

There will be two midterms and a final exam.

### ***Grading***

The final grade will be based on the homework and final exam according to the following weights:

- Homework: 30%
- First midterm exam: 20%
- Second midterm exam: 20%
- Final exam: 30%

### ***DRC syllabus statement***

USU welcomes students with disabilities. If you have, or suspect you may have, a physical, mental health, or learning disability that may require accommodations in this course, please contact the Disability Resource Center (DRC) as early in the semester as possible (University Inn # 101, 435-797-2444, [drc@usu.edu](mailto:drc@usu.edu)). All disability related accommodations must be approved by the DRC. Once approved, the DRC will coordinate with faculty to provide accommodations.