

**Instructor:** Zhi-Feng Huang, 356 Physics Building  
 Tel: (313) 577 2791; Email: huang@wayne.edu  
 Office hours: Tue & Thurs 10:30am – 11:30am, or by appointment

**Lecture time and location:** T Th 11:45am – 1:10pm, 177 Physics Building

**Prerequisite:** PHY 6400 (Quantum Physics I)

**Textbook:** “Introduction to Quantum Mechanics”, 2nd edition, by D. J. Griffiths, Pearson

**Supplementary/References:** “Quantum Physics”, 3rd edition, by S. Gasiorowicz, Wiley;  
 “Principles of Quantum Mechanics”, 2nd edition, by R. Shankar, Springer.

**Homework:** Posted in Blackboard course website; Collected in class on due date.  
 Late solutions will NOT be accepted; The lowest homework score will be dropped.  
 You must show your own work and solution steps to receive credits, although  
 group discussions are allowed. Any copy from other sources (e.g., from other  
 students, internet, or elsewhere) is prohibited and will be given 0 credit.

**Exams:** Two midterm exams: to be announced at least 1 week in advance (NO make-up exams).  
 Final exam (Cumulative): December 16 (Friday), 10:40am – 1:10pm.

**Grading:** 1st exam: 25%  
 2nd exam: 25%  
 Final exam: 35%  
 Homework: 15%

A: 90 – 100%; A-: 85 – 89%
B+: 80 – 84%; B: 75 – 79%; B-: 70 – 74%
C+: 65 – 69%; C: 60 – 64%; C-: 55 – 59%
D+: 50 – 54%; D: 45 – 49%; D-: 40 – 44%
F: 0 – 39%

### Learning outcomes

This course is a continuation of PHY 6400 Quantum Physics I. Students are expected to learn and understand the concepts, some approximation methods, and applications of Quantum Mechanics, and be able to solve the related problems. Detailed topics are listed below.

- Brief review of materials in Quantum Physics I.
- Single-electron atoms: The real Hydrogen atom, spin, fine structure, Zeeman effect, hyperfine structure; The Van der Waals interaction between atoms.
- Multielectron atoms and molecules; Helium, Hydrogen molecule ion; The variational principle.
- The WKB approximation; Tunneling.
- Time-dependent perturbation theory; Transitions and emissions.
- Many-particle systems: The Fermi gas; Solids and band structure.
- Quantum statistics.

## **Additional resources and help**

Student Disability Services: If you have a documented disability that requires accommodations, you will need to register with Student Disability Services (SDS) for coordination of your academic accommodations. The Student Disability Services (SDS) office is located at 1600 David Adamany Undergraduate Library in the Student Academic Success Services department. SDS telephone number is 313-577-1851 or 313-577-3365 (TDD only). Once you have your accommodations in place, I will be glad to meet with you privately during my office hours to discuss your special needs. Student Disability Services' mission is to assist the university in creating an accessible community where students with disabilities have an equal opportunity to fully participate in their educational experience at Wayne State University.

Please be aware that a delay in getting SDS accommodation letters for the current semester may hinder the availability or facilitation of those accommodations in a timely manner. Therefore, it is in your best interest to get your accommodation letters as early in the semester as possible.