
Mon, Wed, Frid 10:00 - 10:53AM Javits Lecture Hall 101
Instructor: Tzu-Chieh Wei <tzu-chieh.wei[at]stonybrook[dot]edu>
Office hour: 5-6pm Wed (TBC), Math Building 6-101

TA: TBA
Office TBA

Course description:
The concepts, historical development, and mathematical methods of quantum mechanics. Topics include Schroedinger's equation in time-dependent and time-independent forms; one- and three-dimensional solutions, including the treatment of angular momentum and spin. Applications to simple systems, especially the hydrogen atom, are stressed.

Prerequisite: PHY 300 (Waves and Optics), 301 (Electromagnetic Theory I), and 303 (Mechanics) [also assume you have taken PHY 251 (Modern Physics)]

Learning outcomes:
Students who complete this course will be able to solve Schroedinger’s equation for simple systems in one, two and three dimensions, including angular momentum and spin, especially the hydrogen atom. In addition to the mathematical skill, an important focus will be to develop students' intuition about the behavior of quantum mechanical particles.

Textbook :
Introduction to Quantum Mechanics (2nd Edition) by David J. Griffiths [required]
(see the University Bookstore, Amazon or other stores)

References
Quantum Mechanics: The Theoretical Minimum by Leonard Susskind and Art Friedman [optional]
The Feynman Lectures on Physics, Vol. 3 [optional]

Grades: (tentative)
Homework 30%
Quizzes & In-class Exams 30%
Final Exam (2.5hr) 40%

Topics to be covered and tentative syllabus
Overview and the Wave Function:
(week 1) [1/25,1/27,1/29]
(week 2) [2/1,2/3,2/5]

Time Independent Schroedinger Equation:
(week 3) [2/8,2/10,2/12]
(week 4) [2/15,2/17,2/19]
(week 5) [2/22,2/24,2/26]

Formalism:
(week 6) [2/29, 3/2, 3/4] In-class Exam I: 3/4
(week 7) [3/7, 3/9, 3/11]
(week 8) Spring recess

Quantum Mechanics in Two and Three Dimensions:
(week 9) [3/21,3/23,3/25]
(week 10) [3/28,3/30,4/2]
(week 11) [4/4,4/6,4/8] In-class Exam II: 4/6
(week 12) [4/11,4/13,4/15]

Identical Particles:
(week 13) [4/18,4/20,4/22]
(week 14) [4/25,4/27,4/29]

Additional Topics:
(week 15) [5/2,5/4,5/6]

Final exam: 8am-10:45am (2.5hrs plus 15min administration) TBC; see Registrar

Announcement, Update and Additional Information

Recommended YouTube videos by Leonard Susskind:
1. MATH YOU NEED FOR QUANTUM MECHANICS (part 1) - Leonard Susskind
2. MATH YOU NEED FOR QUANTUM MECHANICS (part 2) - Leonard Susskind

(See Blackboard.stonybrook.edu for further announcement)

For your information:
A brief guide to 'Student Success Resources' that are available on our campus:
https://ucolleges.stonybrook.edu/links/academic-success-resources.pdf

Americans with Disabilities Act:
If you have a physical, psychological, medical or learning disability that may impact your course work, please contact Disability Support Services (631) 632-6748. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students requiring emergency evacuation are encouraged to discuss their needs with their professors and Disability Support Services. For procedures and information, go to the following web site http://studentaffairs.stonybrook.edu/dss/

Academic Integrity:
Each student must pursue his or her academic goals honestly and be personally accountable for all submitted work. Representing another person's work as your own is always wrong. Faculty are required to report any suspected instances of academic dishonesty to the Academic Judiciary. Faculty in the Health Sciences Center (School of Health Technology & Management, Nursing, Social Welfare, Dental Medicine) and School of Medicine are required to follow their school-specific procedures. For more comprehensive information on academic integrity, including categories of academic dishonesty, please refer to the academic judiciary website at http://www.stonybrook.edu/uaa/academicjudiciary/

Critical Incident Management:
Stony Brook University expects students to respect the rights, privileges, and property of other people. Faculty are required to report to the Office of Judicial Affairs any disruptive behavior that interrupts their ability to teach, compromises the safety of the learning environment, or inhibits students' ability to learn. Faculty in the HSC Schools and the School of Medicine are required to follow their school-specific procedures.

Electronic Communication:
Email to your University email account is an important way of communicating with you for this course. For most students the email address is ‘firstname.lastname@stonybrook.edu’, and the account can be accessed here: http://www.stonybrook.edu/mycloud. *It is your responsibility to read your email received at this account.*

For instructions about how to verify your University email address see this: http://it.stonybrook.edu/help/kb/checking-or-changing-your-mail-forwarding-address-in-the-epo. You can set up email forwarding using instructions here: http://it.stonybrook.edu/help/kb/setting-up-mail-forwarding-in-google-mail. If you choose to forward your University email to another account, we are not responsible for any undeliverable messages.
Religious Observances:
See the policy statement regarding religious holidays at http://www.stonybrook.edu/registrar/forms/RelHolPol%20081612%20cr.pdf Students are expected to notify the course professors by email of their intention to take time out for religious observance. This should be done as soon as possible but definitely before the end of the ‘add/drop’ period. At that time they can discuss with the instructor(s) how they will be able to make up the work covered.

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