

PHYSICS 511 QUANTUM MECHANICS

Fall 2026

Lectures: Tuesday, Thursday, 11:00 AM -- 12:20 PM, P-113, Physics Bldg.

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office hours: B-140, Tuesday 12:30-1:30 PM, also by appointments

Teaching assistant: Pavel Zakharevskii, pavel.zakharevskii@stonybrook.edu

office hour: B-130, Thursday 12:30-1:30 PM, also by appointments

Textbook: J.J. Sakurai and Jim Napolitano, "Modern quantum mechanics" (Cambridge Univ. Press, 2021)

Supplementary L.D. Landau and E.M. Lifshitz, "Quantum mechanics",

reading: R. Shankar, "Principles of quantum mechanics".

This is a course in graduate quantum mechanics. It will cover the material discussed in Sakurai and some selection of additional topics related to modern developments in quantum information and quantum measurements. Approximate outline of the course:

1. Basic concepts: Hilbert space, quantum dynamics, measurements, using as an example two-state quantum systems. Elements of quantum information.
2. One-dimensional problems.
3. Angular momentum, spin.
4. Symmetry in quantum mechanics.
5. Hydrogen atom.

Grading:	Homework	30%
	Midterm	30%
	Final	40%

Exams:

Midterm

Final Thursday, December 10, 11:15 AM -1:45 PM.

Relatively brief **homework assignments** will be given roughly every week.

Learning outcomes

Students who complete this course should

- have a deep understanding of the foundations of quantum mechanics, methods of solution of the one-dimensional problems and three-dimensional Schrödinger equation with central potentials;
- have some basic understanding of ideas underlying quantum information theory and quantum measurements;
- be better prepared to take the quantum mechanics part of the qualifying exam.

Student Accessibility Support Center statement:

If you have a physical, psychological, medical, or learning disability that may impact your course work, please contact the Student Accessibility Support Center, Stony Brook Union Suite 107, (631) 632-6748, or at sasc@stonybrook.edu. They will determine with you what accommodations are necessary and appropriate. All information and documentation is confidential.

Students who require assistance during emergency evacuation are encouraged to discuss their needs with their professors and the Student Accessibility Support Center. For procedures and information go to the following website: <https://ehs.stonybrook.edu//programs/fire-safety/emergency-evacuation/evacuation-guide-disabilities> and search Fire Safety and Evacuation and Disabilities.

Academic Integrity statement:

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 members are required to report any suspected instance of academic dishonesty to the Academic Judiciary. 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, and/or inhibits students' ability to learn.