PHYSICS 251 MODERN PHYSICS

Fall 2025

Lectures Tuesday, Thursday 11:00 AM -- 12:20 PM, Room P-118, Grad. Physics
Instructor: Prof. Dmitri Averin, dmitri.averin@stonybrook.edu

office hours: Tuesday, 12:30—1:30 PM, B-140 Grad. Physics; also by appointment.

Recitations

Section 1 Tuesday 2:00 -- 2:55 PM, Room 128, Chemistry
Section 2 Thursday 2:00 -- 2:55 PM, Room 128, Chemistry
Instructor: Prof. Joanna Kiryluk, joanna.kiryluk@stonybrook.edu

office hours: tbd

Textbook/ Homework access: Webassign;

S.T. Thornton; A. Rex; C. Hood. `` Modern physics for scientists and engineers'' Ed. 5.

Outline

This is the basic introduction to foundations of modern physics focused on

- Special Relativity (electromagnetism)
- Non-relativistic Quantum Mechanics
- Statistical Mechanics

and, time permitting, some examples of their applications:

- Classical and quantum information theory
- Physics of semiconductor devices

Grading will be based on
Homework assignments (submitted online through Webassign) 15%,
Recitation grade (attendance and quizzes, given roughly once every two weeks) 15%
Midterm 30%
Final exam 40%.
A passing grade will require not less than 35% of the total.

Exam policy
Calculators are necessary, and personal handwritten notes are permitted without limitations.

Midterm: Middle of October, during the lecture time: 11:00 AM -- 12:20 PM, Room P-118;
precise date to be determined later

Final: Thursday, December 11, 11:15 AM – 1:45 PM in the lecture room.

Student Learning Outcomes: Students who successfully complete this course

- will have a basic understanding of the foundations of relativity theory, quantum and statistical mechanics;
- should be able to perform elementary calculations in these areas
- will have some knowledge of current research topics in classical and quantum information theory

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.

http://www.stonybrook.edu/uaa/academicjudiciary/