Nazarbayev University, Department of Physics
Syllabus for PHYS 451: Quantum Mechanics I (Fall 2014)

Location & Contact Info
Instructor: Sergiy Bubin
Lecture Hours: TR 9:00 AM - 10:15 AM at room 8.317
Recitations: T 12:00 PM - 1:15 PM at room 7.517
Office Hours: TR 14:00-15:00 at room 7.204 (or by appointment)
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Course Website: http://sergiybubin.org/teaching.html

Course Description In this course, students learn the basics of non-relativistic quantum mechanics. The course introduces quantum-mechanical operators, wave functions, Hilbert spaces, Heisenberg uncertainty principle, Heisenberg and Schrödinger formulations of quantum mechanics and their interpretation in terms of physical observations. The course further covers the topics of potential wells, potential barriers, quantum harmonic oscillator, and the hydrogen atom. The course will include two lectures per week accompanied by a recitation.

Required Textbook
David J. Griffiths, *Introduction to Quantum Mechanics* (2nd Edition)

Other Useful References Many other texts exist on quantum mechanics at the introductory level, some can be found in the library, and can also be very useful in this course. Students are encouraged to explore those. Examples are:

- Richard Liboff, *Introductory Quantum Mechanics* (4th Edition)
- Robert Scherrer, *Quantum Mechanics: An Accessible Introduction*
- Robert Eisberg, David O. Caldwell, and Richard J. Christman, *Quantum Physics of Atoms, Molecules, Solids, Nuclei, and Particles*
- Ira N. Levine, *Quantum Chemistry* (6th Edition)

Grading Policy The course will be graded based on the cumulative score. The minimum cumulative percentages necessary for obtaining the following letter grades will approximately be:

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\begin{array}{ccc}
 & A \geq 90.0\% & A- \geq 86.6\% \\
B+ \geq 83.3\% & B \geq 80.0\% & B- \geq 76.6\% \\
C+ \geq 73.3\% & C \geq 70.0\% & C- \geq 66.6\% \\
D+ \geq 63.3\% & D \geq 60.0\% & D- \geq 56.6\%
\end{array}
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There will be two midterm tests and one final exam. Homework will be assigned on a nearly weekly basis and will typically be due Thursday in class, unless otherwise indicated. In addition, short quizzes will be arranged on random dates. The problems in quizzes may resemble those found in the recent homework. The cumulative scores for the letter grades will be computed as follows:

Homework:	10%
Quizzes:	10%
Midterm 1:	20%
Midterm 2:	20%
Final Exam:	40%

An extra credit (up to 2%) may be earned through active participation in recitations and lectures. All work to be considered for a regrade must be submitted no later than one week after it was given back to the students. No late howework assignments will be accepted, but one homework with the lowest score will be dropped. One quiz with the lowest score will also be dropped. There will be no make-up for any of the exams, unless there is a serious and well documented reason for missing it.

Homework Submission Guidelines The submission of only answers is not acceptable. Homework must show suffcient proof that a derivation of the solution was carried out. Any student wishing to have the best possible grades on homework returned must:

- Staple pages together and clearly indicate problem numbers
- Turn in neat and readable homework as points may be deducted otherwise
- Show work! Solutions or answers turned in without explanation will not receive full credit

Homework submission in paper form is strongly preferred. However, electronic submissions via email (e.g. a pdf file of scanned pages) are acceptable for those students who are away or must miss a class when the homework is due.

Academic Integrity Students are expected to follow Nazarbayev University student code of conduct, which can be found at http://registrar.nu.edu.kz/policies-and-procedures, and adhere to the principles of truth and academic honesty. Students who infringe upon the code of conduct will be subject to sanction. While students are strongly encouraged to discuss the homework among themselves, plagiarism is strictly prohibited. No collaboration, notes, books, calculators, or use of mobile phones will be allowed during the tests.

Communication Email communication with students is vital for this course. Hence, students are expected to use email for quick correspondence regarding lecture material, homework problems, and anything else that does not require long explanations (for which office hours exist). Moreover, students are responsible for checking their NU email regularly (daily) as important messages and announcements may be sent to the class by email. Please preclude [PHYS451] in the subject line of all your email messages that are related to this course (this will make search and filtering easier).

Homework assignments, solutions to homework assignments, exam solutions, and other relevant materials (including this syllabus) will be made available in the electronic form on the course website. Neither homework assignments nor solutions will be handed out to students in paper form in classroom.