Quantum Mechanics I

PHY C56 S
Winter 2016

Professor Hanno Rein

Lecture	Wednesdays 10:00 am - 12:00 pm BV 361
Tutorial	Tuesdays 10:00 am - 12:00 pm IC 328
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Office hours	Tuesdays, 1:00 pm - 2:00 pm, SW504C Wednesdays, 1:00 pm - 2:00 pm, SW504C
Textbooks	The lectures will roughly follow this textbook: Introduction to Quantum Mechanics, David J. Griffiths, Pearson, 2nd edition Another textbook that might be of interest: Quantum Mechanics, David McIntyre, Pearson
Lectures	We will closely follow the excellent textbook by David Griffiths. The tentative lecture schedule is listed below with relevant chapters. It is a good idea to read the chapters before the class. Note that the schedule may change in response to feedback from you.
Tutorials and problem sets	Each week, you will be given a problem set at the end of the lecture or the end of the tutorial. The deadline for submission is the following week on Monday at noon. This is a hard deadline. We will discuss the problems the following day in the tutorial. The problems will closely follow the course material and are designed to prepare you for the tests and the exam. You can drop off the work at my office on the fifth floor of the Science Wing or via e-mail. If you submit your work via e-mail, you need to use LaTeX and submit both the `.tex` and `.pdf` files. LaTeX submission will get a 10% bonus. You may work in groups to solve the problems but you need to hand in your own set of answers. Photocopying (for paper submission) and copy-and-pasting (for e-mail submission) is not sufficient.

Most importantly, **if you submit an answer, you need to understand it**. Be prepare to present your answer at the blackboard during the tutorial. The presenter will be selected randomly among all students who have submitted a correct answer. You need to present at least three of your answers over the length of the course. Failure to be able to present a submitted (and correct) answer will nullify all answers to the week's problem set. The fraction of submitted and correctly solved problems will constitute points towards your total grade.

Final Exam

The final exam will take place during the exam period. The exam may include, but is not restricted to, material from all lectures and all tutorials. You can use a non-programmable calculator.

Grading Scheme

The final grade will be calculated from submitted turotial work, two tests and a final exam. The ratio is as follows:

Tutorial work	30 points
Test 1	15 points
Test 2	15 points
Final exam	40 points

Absences

In the case of a problem that supports an absence to a tutorial session or an inability to hand in a problem set before the tutorial session, your grade will be calculated on the basis of all other tutorial work. In the case of a problem that supports the absence to one of the tests, your grade will be calculated by increasing the weight of the other test and the final exam. Valid and official supporting documentation must be submitted within five business days of the missed tutorial or test.

Accessibility

Students with diverse learning styles and needs are welcome in this course. In particular, if you have a disability/health consideration that may require accommodations, please feel free to approach me and/or the AccessAbility Services Office as soon as possible. I will work with you and AccessAbility Services to ensure you can achieve your learning goals in this course. Enquiries are confidential. The UTSC AccessAbility Services staff (located in SW302) are available by appointment to assess specific needs, provide referrals and arrange appropriate accommodations (416) 287-7560 or `ability@utsc.utoronto.ca`.

Academic Integrity

Academic integrity is one of the cornerstones of the University of Toronto. It is critically important both to maintain our community which honours the values of honesty, trust, respect, fairness and responsibility and to protect you, the students within this community, and the value of the degree towards which you are all working so diligently. Detailed information about how to act with academic integrity, the Code of Behaviour on Academic Matters, and the processes by which allegations of academic misconduct are resolved can be found online: `http://www.artsci.utoronto.ca/osai/students`.

According to Section B of the University of Toronto's Code of Behaviour on Academic Matters (`http://www.governingcouncil.utoronto.ca/policies/behaveac.htm`) which all students are expected to know and respect, it is an offence for students to:

- To use someone else's ideas or words in their own work without acknowledging that those ideas/words are not their own with a citation and quotation marks, i.e. to commit plagiarism.

- To include false, misleading or concocted citations in their work.
- To obtain unauthorized assistance on any assignment.
- To provide unauthorized assistance to another student. This includes showing another student completed work.
- To submit their own work for credit in more than one course without the permission of the instructor.
- To falsify or alter any documentation required by the University. This includes, but is not limited to, doctor's notes.
- To use or possess an unauthorized aid in any test or exam.

Specificlly to this course, please be reminded that you need to understand every solution that you submit. If you work together on an assignment, you still have to be able to present your submission.

There are other offences covered under the Code, but these are by far the most common. Please respect these rules and the values which they protect. Offences against academic integrity will be dealt with according to the procedures outlined in the Code of Behaviour on Academic Matters.

Tentative Class Schedule

Week	Date	Lecture	Tutorial
1	Jan 4	Vectors and Matrices Appendix A1-A3	No tutorial
2	Jan 11	Eigenvectors & Eigenvalues Appendix A4-A6	Assignment 1
3	Jan 18	Hilbert Space and Observables Chapters 3.1 - 3.2	Assignment 2 (Saeed)
4	Jan 25	Eigenfunctions and Operators Chapters 3.3 - 3.4	Assignment 3 (Saeed)
5	Feb 1	The Uncertainty Principle Chapter 3.5	Term test discussion
6	Feb 7	Dirac Notation, Oscillator Chapters 3.6, 2.3	Assignment 4 (Saeed)
7		Reading Week No Tutorial/Lecture	
8	Feb 22	Spherical Schrödinger Equation Chapter 4.1	TBD
9	Feb 29	The Hydrogen Atom Chapter 4.2	Assignment 5
10	Mar 7	Angular Momentum Chapter 4.3	Assignment 6
11	Mar 14	Spin - Part 1 Chapter 4.4	Term test discussion
12	Mar 21	Spin - Part 2 Chapter 4.4	Assignment 7
13	Mar 28	Two Particle Systems Chapter 5.1	Assignment 8