Time: M W F 12.35 PM - 1.25 PM   **Room:** Rutherford 114

Course Outline

1. Basics of Matrix Mechanics

2. Stern-Gerlach Experiments and spin-1/2 particles

3. Angular Momentum Algebra

4. Hamiltonian and Schrödinger Equation

5. Time Evolution of Quantum States

6. Multiple spin-1/2 particles

7. Bell states and entanglement

8. Particle in one dimension

9. Wave packets, Heisenberg uncertainly relation.

10. The Harmonic Oscillator

11. Numerical Solutions to the Schrodinger Equation

Online recording

Lectures will be held in person unless specified otherwise. The professor will broadcast/record lectures via Zoom *on a best-effort basis*. In the event of technical difficulties and a lecture is not recorded, it will be lost.

Grading Policy

Grades will determined using a combination of scores in approximately 10 problem sets, one midterm, and one final. The midterms and finals will be curved if needed to maintain a reasonable class average. The cumulative score at any point in the semester will be accessible to students on myCourses after grading is completed. The cumulative score out of 100 will determine grades in accordance with McGill grading policies. Weights of various components of the cumulative score are given below.

Problem Sets (top $n-1$ considered)	30 %
Midterm	25 %
Final Exam	45 %

Assignments, TAs, Tutorials

Assignments are fundamental to this course and your learning of the material. New assignments will be posted ∼weekly, and will be due via Crowdmark on Thursdays at 11:59 PM.

The TAs will hold office hours at different times of the week—Evan Chmilar (evan.chmilar@mail.mcgill.ca, Thursdays at noon, ERP 303), Julia Pasiecznik (julia.pasiecznik@mail.mcgill.ca, Tuesdays at 14:30, ERP 314), Zhongan Lin (zhongan.lin@mail.mcgill.ca, Tuesdays at noon, ERP 420), and Vishwangi Shah (vishwangi.shah@mail.mcgill.ca, Mondays at 3-4 PM, ERP 211).

Midterms

The will be one midterm test in late October. We will set the precise date and mode of administration in consultation with the class.

Final Exam

The Final Exam will be take home, and conducted online.

Reading

We will use "A Modern Approach to Quantum Mechanics" by John S. Townsend (Second Edition) and most of the homework will be from the book. We'll cover the first part of the book in this course, Chs. 1—7. Course notes on material not covered by the text will be available online at https://github.com/sievers/Phys-357-2024

Instructor Office Hours

I will be available to answer your questions during and immediately after every class. I will also be holding weekly office hours immediately after class on Wednesdays at 13:30 in my office RPHYS 333. I encourage you to come visit my office to seek clarifications. Emails are not a very good way to get clarifications on the subtleties of quantum mechanics, but feel free to email me questions if you can't make office hours.

Rights/Responsibilities

McGill University values academic integrity. Therefore all students must understand the meaning and consequences of cheating, plagiarism and other academic offenses under the Code of Student Conduct and Disciplinary Procedures (see http://www.mcgill.ca/integrity for more information).

In accord with McGill University's Charter of Students' Rights, students in this course have the right to submit in English or in French any written work that is to be graded.

Instructors who may adopt the use of text-matching software to verify the originality of students' written course work must register for use of the software with Educational Technologies (Email) and must inform their students before the drop/add deadline, in writing, of the use of text-matching software in a

course.

Disclaimer

In the event of extraordinary circumstances beyond the University's control, the content and/or evaluation scheme in this course is subject to change.