

PHY256H1F-Sum *Introduction to Quantum Physics* University of Toronto 2022

Course Description: This is an introductory course on quantum physics. The topics include: wave-particle duality, Schroedinger equation, stationary states, harmonic oscillator, expectation values, uncertainty principle, superposition states, time evolution, scattering & tunneling, angular momentum, the hydrogen atom, Stern-Gerlach experiment, Pauli exclusion principle.

Lectures: Monday and Wednesday 1:10 - 3:00 pm (with 10 minute break) in MP102.
Instructor: Prof. John Wei <wei@physics.utoronto.ca>
Office Hours (by Zoom): TBA by Instructor by Week #1.

Tutorial Sections: A) Monday and Wednesday 3:10 - 4 pm (MP134).
B) Monday and Wednesday 3:10 - 4 pm (MP137).

Teaching Assistants: A) Jason Kattan <jkattan@physics.utoronto.ca>
B) Frank Corapi <frank.corapi@utoronto.ca>

TA Office Hours: A) TBA by TA by Week #1.
B) TBA by TA by Week #1.

Course Textbook: 1) *An Introduction to Quantum Physics*, A.P. French & Edwin F. Taylor, CRC Press, 1st edition (2017). [Free e-book: see link below]
<https://doi-org.myaccess.library.utoronto.ca/10.1201/9781315137308>

Supplementary Text: 2) *Modern Physics*, Randy Harris, Pearson Addison-Wesley (2nd edition)
Excerpts: to be posted on Quercus.

Reference Text: 3) *The Feynman Lectures on Physics*, Volume III, Feynman-Leyton-Sands
Free e-copy: <http://www.feynmanlectures.caltech.edu>.

Prerequisites: PHY 132H1 or 152H1, MAT 135H1 or 136H1, MAT 137Y1 or 157Y1.

Co-requisites: MAT 235Y1 or 237Y1 or 257Y1, (MAT223H1 or 240H1 Recommended)

Grading Scheme:

Homework* (4 Assignments):	12%
Quiz #1** (30 minutes):	11%
Term Test*** (60 minutes):	22%
Quiz #2** (30 minutes):	11%
Final Exam**** (120 minutes):	44%

Course Policy: 1) Homeworks* should be submitted electronically on Crowdmark.
2) Late submission of Homework* is accepted with 50% mark reduction per day.
3) Formats for the Quizzes**, Test*** and Exam**** will be announced on Quercus.
4) All course material will be posted on Quercus.

* Assigned by the Friday of Weeks #1, #2, #3, #4, and due by the Friday of Weeks #3, #4, #5, #6.

** To be given in-class on May 30 (Monday) and June 20 (Monday, last day of classes).

*** To be given in-class on June 6 (Monday).

**** Final Exam will be given June 22 – 29 at a time specified by the Faculty of Arts & Sciences.

Note: there will be no Makeups for the Quizzes, Term Test or Final Exam.

Lecture Coverage: We plan to cover most of Chapters 1 - 5 and 8 - 13 in the course textbook.

If time permits, there will also be a bonus Lecture on the special topic of Superconductivity.

Health & Safety Measures:

Policy on COVID Vaccination: <https://www.utoronto.ca/utogether/vaccines>

Policy on Face Masks: <https://governingcouncil.utoronto.ca/secretariat/policies/face-masks-policy>

FAQs: <https://www.artsci.utoronto.ca/covid19-artsci-student-faqs#summer-2022-courses-accordion-1>

STUDENTS WITH DISABILITIES OR ACCOMMODATION REQUIREMENTS

Students with diverse learning styles and needs are welcome in this course. If you have an acute or ongoing disability issue or accommodation need, you should register with Accessibility Services (AS) at the start of the academic year at <http://www.studentlife.utoronto.ca/as/new-registration>. Without registration, you will not be able to verify your situation with your instructors, and instructors will not be advised about your accommodation needs. AS will assess your situation, develop an accommodation plan with you, and support you in requesting accommodation for your course work. Remember that the process of accommodation is private: AS will not share details of your needs or condition with any instructor, and your instructors will not reveal that you are registered with AS.

RELIGIOUS ACCOMMODATION

As a student at the University of Toronto, you are part of a diverse community that welcomes and includes students and faculty from a wide range of cultural and religious traditions. This course will make every reasonable effort to avoid scheduling tests, examinations, or other compulsory activities on religious holy days not captured by statutory holidays. Further to University Policy, if you anticipate being absent from class or missing a major course activity (such as a test or in-class assignment) due to a religious observance, please notify the Course Instructor as early as possible, and with sufficient notice (at least two to three weeks), so that we can work together to make alternate arrangements.

SPECIFIC MEDICAL CIRCUMSTANCES

If you become ill and it affects your ability to do your academic work, consult the Course Instructor right away. Normally, you will be asked for medical documentation in support of your specific medical circumstances. The University's Verification of Student Illness or Injury (VOI) form is recommended because it indicates the impact and severity of the illness, while protecting your privacy about the details of the nature of the illness. You can submit a different form (like a letter from a doctor), as long as it is an original document, and it contains the same information as the VOI. For more information, please see <http://www.illnessverification.utoronto.ca>. If you get a concussion, break your hand, or suffer some other acute injury, you should register with Accessibility Services as soon as possible.

MENTAL HEALTH AND WELL-BEING

As a student, you may experience challenges that can interfere with learning, such as strained relationships, increased anxiety, substance use, feeling down, difficulty concentrating and/or lack of motivation, financial concerns, family worries and so forth. These factors may affect your academic performance and/or reduce your ability to participate fully in daily activities. Everyone feels stressed now and then – it is a normal part of university life. Some days are better than others, and there is no wrong time to reach out. There are resources for every situation and every level of stress. There are many helpful resources available through your College Registrar or through Student Life (<http://studentlife.utoronto.ca> and <http://www.studentlife.utoronto.ca/feeling-distressed>). An important part of the University experience is learning how and when to ask for help. Please take the time to inform yourself of available resources.

ACCOMMODATION FOR PERSONAL REASONS

There may be times when you are unable to complete course work on time due to non-medical reasons. If you have concerns, speak to the Course Instructor or to an advisor in your College Registrar's office; they can help you to decide if you want to request an extension or accommodation. They may be able to provide you with a College Registrar's letter of support to give to your course instructors, and importantly, connect you with other resources on campus for help with your situation.

ACADEMIC INTEGRITY

All students, faculty and staff are expected to follow the University's guidelines and policies on academic integrity. For students, this means following the standards of academic honesty when writing assignments, collaborating with fellow students, and writing tests and exams. Ensure that the work you submit for grading represents your own honest efforts. Plagiarism—representing someone else's work as your own or submitting work that you have previously submitted for marks in another class or program—is a serious offence that can result in sanctions. Speak to the Course Instructor or your TA for advice on anything that you find unclear. To learn more about how to cite and use source material appropriately and for other writing support, see the U of T writing support website at <http://www.writing.utoronto.ca>. Consult the Code of Behaviour on Academic Matters for a complete outline of the University's policy and expectations. For more information, please see <https://www.artsci.utoronto.ca/current/academic-advising-and-support/student-academic-integrity> and <http://academicintegrity.utoronto.ca>.

COURSE MATERIALS

Course materials are provided for the exclusive use of enrolled students. Do not share them with others: do not transmit any of the materials into the public domain or to a person not enrolled in the course or to a third party company. The University supports copyright enforcement related to course material, and licensed third party material appears in the lecture notes with additional restrictions.

QUERCUS

This course uses the University's learning management system, Quercus (<https://q.utoronto.ca>) to post information about the course. This includes posting readings and other materials required to complete class activities and course assignments, as well as important announcements and updates. **Please also note** that any grades posted are for your information only, so you can view and track your progress through the course. No posted grades are considered official, at any point in the term, until they have been formally approved and posted on ACORN at the end of the course.

PRIVACY/FIPPA STATEMENT

Personal information is collected pursuant to section 2(14) of the University of Toronto Act, 1971 and at all times it will be protected in accordance with the Freedom of Information and Protection of Privacy Act. Please note that this course requires presentations of one's work to the group. For more information, please refer to <http://www.utoronto.ca/privacy>.