

Physics 1501A

Enriched Introductory Physics I

Fall 2026

1. Course Information

Calendar description: A calculus-based laboratory course for students intending to pursue further studies in science, particularly the physical sciences. Newton's laws, energy, linear momentum, rotations and angular momentum, gravitation and planetary motion.

Antirequisite(s): [Physics 1021](#), [Physics 1101A/B](#), [Physics 1201A/B](#), [Physics 1401A/B](#), the former [Physics 1028A/B](#), the former [Physics 1301A/B](#).

Prerequisite(s): Grade 12U Calculus and Vectors (MCV4U) or [Mathematics 0110A/B](#).

Corequisite(s): [Calculus 1000A/B](#) or [Calculus 1500A/B](#) or [Numerical and Mathematical Methods 1412A/B](#). The former [Applied Mathematics 1412A/B](#) or the former [Applied Mathematics 1413](#) can be used in place of [Numerical and Mathematical Methods 1412A/B](#).

Extra Information: 3 lecture hours, 3 laboratory/tutorial hours, 0.5 course. *Note:* This course, together with [Physics 1502A/B](#), is a suitable prerequisite for all modules in the Faculty of Science, for all modules offered by the basic medical science departments and for professional schools having a Physics requirement.

Unless students have either the prerequisites for this course or written special permission from the Department of Physics and Astronomy to enroll in it, they may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on their academic record. This decision may not be appealed.

2. Instructor Information

Prof. Martin Houde

Room 207, Physics and Astronomy Building (PAB)

You can reach me via e-mail at mhoude2@uwo.ca. When contacting me by e-mail, please use your UWO e-mail account. Other accounts (such as hotmail and yahoo) are often tagged as spam and may not reach me.

Office Hours: My usual office hours will be posted on OWL by the first week of classes. You are welcome to drop by at the posted times. If held online, the zoom meeting will have a waiting room so you will not immediately connect if someone is already in the zoom meeting with me, but you will be admitted as soon as possible. If the usual office hours are not convenient, you can also send me e-mail if you would like to arrange an alternate meeting time.

Teaching Assistants: The TAs for this course, their contact info and their office hours will be posted on the course OWL web site.

3. Course Syllabus, Schedule, Delivery Mode:

Course Outline (Numbers in parentheses refer to chapters in the OpenStax textbook.)

1. Newton's Laws (Ch. 5–6)
2. Conservation of Energy (Ch. 7–8)
3. Conservation of Linear Momentum (Ch. 9)
4. Conservation of Angular Momentum; Rotational Motion (Ch. 10-11)
5. The Gravitational Interaction, with astrophysical applications (Ch. 13)
6. Fluid Mechanics (Ch. 14)
7. *The Principle of Least Action (if time permits)*

Course-level learning outcomes:

The aim of this course is not only to gain a thorough understanding of the physics topics covered in class, but also to learn how to *think like a physicist* when describing phenomena or solving problems. Thus, by the end of this course, students should be able to:

- use a step-by-step problem-solving strategy underpinned with conceptual understanding to logically work through complex problems.
- reason through conceptual physics problems using clear, concise writing and diagrams.
- use knowledge and/or intuition to evaluate whether the answer to a problem makes sense.
- develop physics thinking skills and problem-solving approaches that are useful in a wide variety of different fields
- extend and apply Newton's Laws of Motion and conservation laws.
- acquire hands-on skills in experimental physics through the attendance and completion of laboratories.
- perform appropriate experimental set-up, data collection and analysis to investigate a physical relationship.
- apply research skills such as measurement taking, uncertainty propagation, graphical analysis, and written discussion of results in the lab.
- engage in critical analysis of a problem individually and through team effort, effectively communicating your approach to others, through laboratory projects or other activities
- acquire an intuitive understanding of fundamental physics concepts
- learn calculus-based techniques in some approaches.
- develop physics thinking skills and problem-solving approaches that are useful in other fields and in everyday situations.

Format: This course will take place in person; however, it may transition to an online format if required. I use chalk and a blackboard in class but my lecture notes will be posted prior to each class on OWL Brightspace (<https://westernu.brightspace.com>). The class will take place in room PAB 148 on Mondays, Wednesdays, and Fridays 9:30-10:20 AM. Tutorials will take place on some Mondays 2:30-4:20 PM in PAB 148. Labs will take place on some Mondays 2:30-5:30 PM in the Materials Science Addition (MSA) Building on the second floor. The first lecture will be on Wednesday September 9 2026. Please see the table below.

Tutorials: Physics 1501A has tutorials hosted by the course's Teaching Assistants. They usually occur in the weeks between labs. You should bring a laptop to the tutorials if you can, but you can also work with a classmate on their computer. The tutorials will be held on Monday afternoons in room PAB 148. The schedule is subject to change, but five tutorials are expected to take place at 2:30 PM to 4:20 PM on Sep. 28, Oct. 26, Nov. 9, Nov. 23 and Dec. 7. The tutorials are expected to take place in-person but may instead take place via zoom, should conditions require it. In tutorials, after some introductory material from the instructor or TAs, students will then break up into small groups to work on the tutorial worksheets together in real-time. You are expected to attend tutorials.

Laboratories:

Labs will be held on some Mondays, 2:30-5:30 PM in the Materials Science Addition (MSA) Building. A laboratory orientation lecture will be posted on the OWL site by the first week of September. You must visit the course OWL site and familiarize yourself with the contents of this lecture before attending your first lab session. Labs are expected to be done in-person (except for the first Measurement lab, see more below) at this time but could transition to an online format.

The Physics 1501A laboratory timetable will be posted on the course OWL site. You must find your correct lab section, lab subsection, and the correct laboratory timetable before attending the first lab. Please attend the correct lab class on the correct date, as we do not give permission to attend lab classes outside your laboratory schedule. If you have difficulty following the timetable scheduled for your lab sub-section, please contact the laboratory coordinator at physlab1@uwo.ca.

There are four labs to be completed. The first lab on Measurement, is to be done entirely online through the OWL website. There are also three in-person labs. These are tentatively scheduled for Sep. 21, Oct. 19 and Nov. 2. The due dates are usually one week later via online submission through Gradescope.

4. Course Materials

Course Content: As previously stated, my lecture notes will be made available (in PDF form) prior to each class on OWL Brightspace. These notes are comprehensive and are the primary material to study from in the course. However, you can also access the University Physics

(Volume 1 contains the material covered in the course) textbook from OpenStax for free online at <https://openstax.org/details/books/university-physics-volume-1> for consultation and study, if desired.

Lab Manual: Physics Laboratory Manual 2026 for Physics 1501A. This Lab Manual will be available for purchase on *Perusall*, or from the Western Bookstore. You are required to purchase the first-semester lab manual for the course (go to [https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2026A&courses\[0\]=001_UW/PHY1501A](https://bookstore.uwo.ca/textbook-search?campus=UWO&term=W2026A&courses[0]=001_UW/PHY1501A)). Please contact the course JIRA <https://help.sci.uwo.ca/servicedesk/customer/portal/8> if you have any difficulties obtaining this lab manual.

OWL: Students are responsible for checking the course OWL Brightspace (<https://westernu.brightspace.com>) site on a regular basis for news and updates. The site will contain all lecture content and important course material. This will also contain this [link](#) to *Perusall* for the laboratory manual. This is the primary method by which information will be disseminated to all students in the class. If students need assistance with OWL, they can seek support on the OWL Help page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

Gradescope: Lab write-ups in the course will be submitted via the [gradescope.ca](https://www.gradescope.ca) website. Gradescope should be accessed directly from the OWL course website (see link on the left side in the appropriate week), not by navigating to [gradescope.ca](https://www.gradescope.ca). Gradescope will accept scans, annotated PDFs or photos of handwritten assignment pages. These will be accessed by the TAs to grade, and marks and feedback will be returned to the student via Gradescope.

5. Methods of Evaluation

Assignments: You will receive lists of suggested problems during the semester. At times, I will require that you turn in specific problems as assignments; there will probably be three such assignments during the semester. Students will be allowed to discuss the material among themselves, but each student will have to turn in her/his own copy of the assignment. Assignments must be turned in at the requested date and submission will be done online through Gradescope. Submissions must be done before or during the 48 hour no-late-penalty period. Assignments submitted after this period will have their weight shifted to the final exam, as full solutions are posted at the end of the assignment no-late-penalty period.

Term Tests: There will be two in-class term tests, each lasting 50 minutes. The midterms are expected to happen on the following dates: Wednesday, Oct. 7 2026; and Wednesday Nov. 11 2026 but are subject to change: any changes will be announced in class. These are cumulative and could test material on topics covered at any earlier point in the course. Bring a calculator but no notes or books will be allowed; a formula sheet may be allowed or supplied. The tests will include problems to be worked out. This means that you must start from fundamental principles

to develop the formulae that describe the mathematical model of the physical situation, explaining your reasoning as you go.

Final Exam: Three hours long, covers material of the entire course and will be worth 35% of the course final grade. Note that the final exam may contain lab questions and that all students must be prepared for that, even those who obtain a lab exemption. Bring a calculator; a formula sheet may be allowed or supplied with the exam. Date, time, and location are to be announced. The Final Exam must be taken: there will be one makeup Final Exam.

To pass Physics 1501A, a student must both achieve at least 50 out of 100 marks overall *and* obtain at least 50% on the final examination. Passing the final examination is an essential learning requirement of this course: a student who does not achieve at least 50% on the final examination will not pass the course, regardless of their calculated overall grade. In such a case, the final course grade will be recorded as the lesser of the calculated grade and 48%.

Electronic Devices: No electronic devices except standard scientific calculators will be allowed during tests and examinations. Calculators may be of any standard scientific type but may not be wireless-capable.

Lab Completion, Passing, and Grade Requirements: *In order to satisfy the lab requirement for the course, a student **must complete at least three out of the four labs.***

A lab is considered **complete** only when the student:

1. Attends the scheduled lab.
2. Collects the required experimental data.
3. Completes the lab worksheet.
4. Uploads the completed worksheet to Gradescope before the deadline.

To **pass an individual lab**, the student must obtain **at least 5 out of 10 marks** on the submitted lab worksheet. If the student achieves 5/10 or higher, the student receives the **full credit allocated to that lab**.

If the student receives **less than 5/10**, the student has failed that lab. The credit associated with that lab will be **transferred to the final exam**.

Lab Component and Transfer of Marks: The four labs together are worth **10% of the final course grade**, with **each lab contributing 2.5%**.

- If a student **completes and passes all four labs**, they receive the full **10%** lab component.
- If a student **misses a lab or fails a lab**, the percentage associated with that lab will be **transferred to the final exam**.
- For example, if a student completes two labs and passes them but fails the other two labs, the **5% associated with the two failed labs will be transferred to the final exam**.

- Similarly, if a student completes and passes three labs but misses the fourth, the **2.5% associated with the missed lab will be transferred to the final exam**, provided the student otherwise satisfies the course requirements.

SRA: No SRA is required for any lab. If a student submits an SRA for a lab, it will not be considered, as the course already provides flexibility through the built-in mechanism of transferring the credit for a missed or failed lab to the final exam.

Minimum Lab Requirement: A student must **complete at least three out of the four labs** to satisfy the lab component requirement for the course, except where a lab exemption has been obtained at the beginning of the course (i.e., via Accessible Education, or because the student had already passed the lab component and the entire course in a previous term, and is only repeating the course for grade improvement). If a student **does not complete the required number of labs**, the student will be automatically withdrawn (WDN) from the course, and may request an Incomplete (INC) from the Dean of Science for receiving an Incomplete (INC) standing, provided that the student has otherwise passed the course.

Finally, satisfying the lab requirement does not guarantee that the student will pass the course overall. As stated above, the student must both **achieve at least 50 out of 100 marks overall and obtain at least 50% on the final examination to pass the course.**

Grading:

Assignments 15%

Labs 10% (Note: students must satisfy the lab component requirement for the course; see above.)

Term Tests (20+20) 40%

Final Exam 35%

Please note: The Department of Physics and Astronomy may, in rare cases, adjust the final course marks in order to conform to Departmental policy.

Tutorial / Laboratory / Exam Schedule

<i>Week of</i>	
Sep. 7	First lecture on Wed Sep 9
Sep. 14	Laboratory – Measurements Lab
Sep. 21	Laboratory – Position, Velocity & Acceleration
Sep. 28	Tutorial
Sep. 30	National Day for Truth and Reconciliation – No lecture
Oct. 5	No lab or tutorial – Term Test 1 on Wed Oct 7

Oct. 12	No lab or tutorial – <i>Fall Reading week</i>
Oct. 19	Laboratory – Work and Energy
Oct. 26	Tutorial
Nov. 2	Laboratory – 1-D Collisions
Nov. 9	Tutorial – Term Test 2 on Wed Nov 11
Nov. 16	No lab or tutorial
Nov. 23	Tutorial
Nov. 30	No lab or tutorial
Dec. 7	Tutorial – Last lecture on Wed Dec 9

Information about Missed Coursework and Academic Consideration

Academic Consideration operates differently in this course for in-term work than for the final examination.

In-term assessments — term tests, labs, and assignments — do not require an Academic Consideration request, and one will not be accepted for them. If you miss or cannot complete any of these, the outcome is handled automatically through the flexible-completion and reweighting rules described in the Methods of Evaluation section above (in brief: the weight of a missed term test shifts to your final exam; missed or failed labs are handled through the minimum-completion requirement for the lab component, with the weight of a missed or failed lab transferred to the final exam, which now assesses the lab material; and any assignment not submitted within the 48-hour no-late-penalty period has its weight shifted to your final exam). You do not need to submit documentation for any in-term assessment.

The final examination is the only component for which Academic Consideration with supporting documentation is required. If you are unable to write the final exam, you must request Academic Consideration through the Student Absence Portal (SAP). You should familiarize yourself with the University's Policy on Academic Consideration for Undergraduate Students in First Entry Programs, posted on the Academic Calendar: [https://uwo.ca/univsec/pdf/academic_policies/appeals/academic_consideration_Sep24.pdf]. This policy does not apply to requests for Academic Consideration submitted for attempted or completed work, whether online or in person. The policy also does not apply to students experiencing longer-term impacts on their academic responsibilities. These students should consult Accessible Education. Procedures for submitting a request are posted on the Office of the Registrar's website: [https://registrar.uwo.ca/academics/academic_considerations/]. A request relating to the final examination must be submitted within 48 hours of the exam date. If Academic Consideration is granted, you will write the Special Examination, as described below.

Term tests

This course has 2 term tests and a **cumulative** final exam. There is no makeup test for a missed midterm. If a student misses a midterm, its weight will shift automatically to their final exam grade. If their final exam grade is higher than their midterm grade, their final exam grade will replace the midterm's weight in their overall grade. They do not need to request Academic Consideration for a missed midterm; the re-weighting will be done automatically.

The only exception is an early sitting, offered solely for a university-sanctioned schedule conflict (e.g., conflict of two midterms, Varsity competitions) or a religious accommodation that prevents a student from writing the midterm at its scheduled time. If a student requires this accommodation, they must notify their instructor in writing no later than one week before the test. No other circumstance, including illness, qualifies for an early sitting or makeup; these are addressed through the automatic re-weighting described above.

Special Examination

Per university policy, Academic Consideration requests with supporting documentation are required for the final examinations scheduled during official examination periods by the Registrar's Office.

If the student has been approved by the Academic Advising Office to write a Special Examination (SPC) and the final exam is their only outstanding course component, an SPC will be assigned to them and scheduled by the instructor per university policy.

If the student misses their SPC exam and is approved for Academic Consideration, they will be withdrawn from the course without academic penalty. If they experienced extenuating circumstances such as prolonged illness, they may request for Relief / Academic Consideration from the Associate Dean (Academic), on a case-by-case basis, for the opportunity to write the final exam the next time the course is offered. An outstanding SPC will reduce their course load for the term in which the exam is deferred, as outlined in the [Definitions of Types of Examinations](#) policy.

If the student misses their SPC exam and Academic Consideration is not approved, or was not requested, they will receive a grade of zero on the exam.

6. Additional Statements

6.1 Religious Accommodation

When a recognized religious holiday either requires a student to be absent from the University, or requires or prohibits an activity that makes it impossible for them to complete an academic requirement scheduled that day, they are entitled to accommodation. No student will be penalized for an absence for religious reasons, and an alternative means of satisfying the requirement will be arranged. This accommodation is provided in accordance with the University's policy on Accommodation for Religious Holidays:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_religious.pdf

The student should submit their requests through the Student Absence Portal (SAP), identifying the conflict and the specific course component(s) affected (e.g., test, midterm, exam).

Midterms and Tests: If a religious observance conflicts with a midterm test, they must submit their request no later than **one week** before the test. Their instructor will arrange an early sitting of the test. As set out above, no makeup test is offered for any other reason; this early sitting is available specifically for this accommodation.

Final Examinations: If a religious observance conflicts with the final exam, the student must submit their request no later than **two weeks** before the exam. Their instructor will arrange a Special Examination to take place no later than one month after the end of the examination period.

Students are responsible for finding out what was covered in any class they miss due to a religious observance, and for taking the appropriate steps to keep up with the course.

If a suitable arrangement cannot be reached between a student and their instructor, they should consult the Undergraduate Chair of the department offering the course, and if necessary, the Associate Dean (Academic) of the Faculty of Science.

For a list of recognized religious observances, please visit the calendars posted on the Equity, Diversity & Inclusion website - <https://www.edi.uwo.ca> (About Us – Resources – Additional Resources – Calendars).

6.2 Academic Accommodation Policies

Students with disabilities are encouraged to contact Accessible Education, which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The policy on Academic Accommodation for Students with Disabilities can be found at:

https://www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Accommodation_disabilities.pdf.

6.3 General Academic Policies

The website for Registrar Services is <https://www.registrar.uwo.ca/>.

Use of @uwo.ca email: In accordance with policy, https://www.uwo.ca/univsec/pdf/policies_procedures/section1/mapp113.pdf, the centrally administered e-mail account provided to students will be considered the individual's official university email address. It is the responsibility of the account holder to ensure that emails received from the University at their official university address are attended to in a timely manner.

Requests for Relief (formally known as “appeals”)

Policy on Request for Relief from Academic Decision:

https://uwo.ca/univsec/pdf/academic_policies/appeals/requests_for_relief_from_academic_decisions.pdf

Procedures on Request for Relief from Academic Decision (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_requests_for_relief_procedure.pdf

6.4 Scholastic Offences

Policy on Scholastic Offences: https://uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_offences.pdf

Procedures on Scholastic Offences (Undergraduate):

https://uwo.ca/univsec/pdf/academic_policies/appeals/undergrad_scholastic_offence_procedure.pdf

Use of Electronic Devices During Assessments

In courses offered by the Faculty of Science, the **possession** of unauthorized electronic devices during any in-person assessment (such as tests, midterms, and final examinations) is strictly prohibited. This includes, but is not limited to: mobile phones, smart watches, smart glasses, hidden cameras and wireless earbuds.

Unless explicitly stated otherwise in advance by the instructor, the presence of any such device at a student’s desk, on their person, or within reach during an assessment will be treated as a scholastic offence, **even if the device is not in use**.

Effective September 2026, the typical penalty for this offence is a failing grade in the course AND a 12-month prohibition on retaking the course.

Only devices expressly permitted by the instructor (e.g., non-programmable calculators) may be brought into the assessment room. It is their responsibility to review and comply with these expectations.

Use of Generative AI Tools

Unless otherwise stated, the use of generative AI tools (e.g., ChatGPT, Microsoft Copilot, Google Gemini, or similar platforms) is **not permitted** in the completion of any course assessments, including but not limited to: assignments, lab reports, presentations, tests, and final examinations.

Using such tools for content generation, code writing, problem solving, translation, or summarization—when not explicitly allowed—will be treated as a **scholastic offence**.

If the use of generative AI is permitted for a particular assessment, the conditions of use will be specified by the instructor in advance. If no such permission is granted, students must assume that use is prohibited. It is the student's responsibility to seek clarification before using any AI tools in academic work.

6.5 Support Services

Academic Advising. Please visit the Science & Basic Medical Sciences Academic Advising webpage for information on adding/dropping courses, academic considerations for absences, requests for relief, exam conflicts, and many other academic-related matters: <https://www.uwo.ca/sci/advising/>.

Mental Health Support. Students who are in emotional/mental distress should refer to Mental Health@Western (<https://uwo.ca/health/>) for a complete list of options about how to obtain help.

Gender-Based and Sexual Violence. Western is committed to reducing incidents of gender-based and sexual violence (GBSV) and providing compassionate support to anyone who has gone through these traumatic events. If a student has experienced GBSV (either recently or in the past), they can find information about support services for survivors, including emergency contacts, at:

https://www.uwo.ca/health/student_support/survivor_support/get-help.html.

To connect with a case manager or set up an appointment, please contact support@uwo.ca.

Accessibility for Coursework. A student may contact the course instructor if they require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to them. If they have any questions regarding accommodations, they may also contact Accessible Education at http://academicsupport.uwo.ca/accessible_education/index.html

Learning Development and Success. Learning-skills counsellors at Learning Development and Success (<https://learning.uwo.ca>) are ready to help students improve their learning skills. The facility offers strategies for improving time management, multiple-choice exam preparation/writing, textbook reading, and more. Individual support is offered throughout the Fall/Winter terms in the drop-in Learning Help Centre, and year-round through individual counselling.

Student Councils.

Student-run support services are offered by the University Students' Council (<https://westernusc.ca/services/>) and the Science Students' Council (<https://www.westernssc.ca>).