

Physics 2101A – Intermediate Physics (Fall 2026) Course Outline

Land Acknowledgement

We acknowledge that Western University is located on the traditional lands of the Anishinaabek, Haudenosaunee and the Lūnaapéewak, on lands connected with the Dish with One Spoon Covenant Wampum between the Anishinaabeg and Haudenosaunee and the London Township and Sombra Treaties of 1796.

With this, we respect the longstanding relationships that Indigenous Nations have to this land, as they are the original caretakers. We acknowledge historical and ongoing injustices that Indigenous Peoples (First Nations, Métis and Inuit) endure in Canada, and we accept responsibility as a public institution to contribute toward revealing and correcting miseducation as well as renewing respectful relationships with Indigenous communities through our teaching, research and community service.

1. Course Information

Course Information

- **Course name and number:** PHYSICS 2101A - INTERMEDIATE PHYSICS
- **Academic Term:** Fall 2026
- **Lectures (Location):** Monday, Wednesday & Friday: 11:30 AM - 12:30 PM (PAB-106)
- **Tutorial (Location):** Friday: 12:30 PM - 1:30 PM (PAB-106)

List of Prerequisites

Prerequisite(s): Physics 1201A/B or Physics 1401A/B or Physics 1501A/B or the former Physics 1301A/B, each with a minimum mark of 60%, or the former Physics 1028A/B with a minimum mark of 80%; Physics 1202A/B or Physics 1402A/B or Physics 1502A/B or the former Physics 1302A/B, each with a minimum mark of 60%, or the former Physics 1029A/B with a minimum mark of 80%; a minimum mark of 60% in each of (Calculus 1000A/B or Calculus 1500A/B or Numerical and Mathematical Methods 1412A/B or the former Applied Mathematics 1412A/B) and (Calculus 1301A/B or Calculus 1501A/B or Numerical and Mathematical Methods 1414A/B or the former Applied Mathematics 1414A/B), or in the former Applied Mathematics 1413. Integrated Science 1001X with a minimum mark of 60% can be used in place of Physics 1202A/B and Calculus 1301A/B.

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or written special permission from the Department of Physics and Astronomy to enroll in it, they may be removed and withdrawn from this course in accordance with university policy. This may be done after the add/drop deadline of the academic term, and the course will be marked as withdrawn (WDN) on their academic record.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

Instructors	Email	Office	Phone	Office Hours
Dr. Lisa Schielicke (Course Coordinator)	lschieli@uwo.ca	PAB 120	519 661 2111 x87770	Wednesday 1:00-2:00 pm (in person, PAB 120)
Alice Guerras (TA)	aguerras@uwo.ca			
Kevin Grosvenor (TA)	kgrosven@uwo.ca			

Students must use their Western (@uwo.ca) email addresses when contacting their instructors. In-person office hours are Wednesday between 1 and 2 pm at PAB 120. Alternatively, students can schedule a meeting by reaching out via email.

3. Course Syllabus, Schedule, Delivery Mode

Course Description: Topics covered: Thermal properties of matter and the laws of thermodynamics, geometric optics, the propagation of light, Maxwell's equations, electromagnetic waves and induction, special relativity.

Topic outline: The course is divided into three parts. Each part is followed by a midterm, or final exam. Lectures 1-11 (before Midterm 1) focus on the topic of Thermodynamics; Midterm 1 will be based on these first 11 lectures (tentative). Lectures 12-23 (before Midterm 2) focus on the topic of Optics; Midterm 2 will be based on content from Lectures 12-23 (tentative). Lectures 24-36 (after Midterm 2) focus on the topics of electromagnetic waves, Maxwell's equations, electromagnetic induction and relativity; the Final Exam will be cumulative (entire course) with a heavier weight on content from the last section (Lectures 24-36). More details regarding exam format, style, etc. will be given in class and uploaded to the Course Information folder on OWL before the first midterm. The general order of topics is as follows (see OWL for a week-by-week breakdown):

1. Thermodynamics (Week 1-4)
2. Optics (Week 5-8)
3. Electromagnetic waves, Maxwell's equations, Inductance (Week 9-11)
4. Special Relativity (Week 12)

Learning outcomes: By the end of the course, the students will be able to

- Apply the laws of thermodynamics to analyze energy transfer, entropy, and thermodynamic cycles.
- Solve quantitative problems involving ideal gases, heat transfer, and thermodynamic processes.
- Apply the principles of geometric and wave optics to explain optical phenomena.
- Analyze image formation by mirrors and lenses using ray and wave models of light.
- Use Maxwell's equations to explain electromagnetic induction and electromagnetic wave propagation.
- Explain and apply the concepts of relativity of simultaneity, time dilation, and length contraction, using and interpreting space-time diagrams, and describe how special relativity emerges from the constancy of the speed of light.

Course Delivery: In-person, 3 lecture hours and 1 tutorial hour per week. Tutorials are an essential part of the course which will provide the student with the opportunity to discuss and review weekly course

contents, assignments, work on calculations and examples and deepen the understanding of the course topics.

Course topics breakdown: A breakdown of course topics with an approximate timeline will be provided on the OWL Brightspace course website.

Relevant Key Sessional Dates:

Classes begin: September 9, 2026

Midterm 1: tba (tentative: at the end of week 4)

Fall Reading Week: October 10 – 18, 2026

Midterm 2: tba (tentative: at the end of lecture week 8)

Classes end: December 9, 2026

Exam period: December 11 – 22, 2026

4. Course Materials

Textbook and Other Learning Materials:

Required textbooks: Openstax - University Physics. Volume 2 and 3, or a similar first year textbook: contact me if you have questions about your text. Links to the books are provided below:

<https://openstax.org/details/books/university-physics-volume-2>

<https://openstax.org/details/books/university-physics-volume-3>

Technical Requirements:

Students will need a non-graphing, non-wifi calculator for the exams.

Costs of Textbooks and Other Learning Materials/Activities:

- The **Openstax books** are open educational resources that *can be used in a digital version without any costs*. A printed version of each volume can be ordered from the the openstax website (<https://openstax.org/subjects/science>) for \$48 (USD, black and white print) or \$58 (USD, color print) additional costs (tax, delivery) may apply.
- **Calculators** such as the Casio fx-82ES PLUS or similar can be bought in the Bookstore or online for approximately \$30 (CAD).

During the course, we might use Personal Response Systems such as iClickers. These can be accessed via electronic devices such as mobile phones, tablets or laptops. If these systems are used, the collected data will not be used to assess the student. Responses submitted through a personal response system must be submitted only by the student registered in the course. Students may not submit responses on behalf of another student.

All course material will be posted to OWL Brightspace: <https://westernu.brightspace.com/>

Students are responsible for checking the course OWL Brightspace site regularly for news and updates. This is the primary method by which information will be disseminated to all students in the class.

If students need assistance with the course OWL Brightspace site, they can seek support on the [OWL Brightspace Help](#) page. Alternatively, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.

5. Methods of Evaluation

Grading Scheme and Assessment Dates

The overall course grade will be calculated as listed below:

Tutorials (best 9 out of 12)	9 %	
Quizzes (best 8 out of 12)	4 %	
Midterm Test 1	21 %	(tba)
Midterm Test 2	21 %	(tba)
Final Exam	45 %	

Tentative List of Topics

Midterm Test 1 covers the topics of weeks 1-4 of the semester on thermodynamics (lectures 1-11, tutorials 1-4). **Midterm Test 2** covers the topics of weeks 5-8 of the semester on optics (lectures 12-23, tutorials 5-8). The **Final Exam** is cumulative covering all topics of the course with 50% of topics related to weeks 9-13, 25% of weeks 1-4 and 25% of weeks 5-8.

There will be weekly online (“take-home”) **learning check quizzes** that are evaluated on a pass/fail basis (best 8 out of 12, pass if 60% of the answers are correct). Each quiz is worth 0.5% of the final course grade, and a maximum of 4% may be earned through the quiz component.

Weekly tutorials review the lecture contents and are evaluated on a pass/fail basis. To pass the tutorial, students need to actively participate in the activities. Each tutorial is worth 1% of the final course grade, and a maximum of 9% may be earned through the tutorial component. Students with a proven course conflict will be offered an alternative assessment. Students with such a conflict need to reach out to the course instructor within the first 3 weeks of the semester.

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

Flexible Completion and Missed Coursework

The Faculty of Science uses a flexible completion and automatic reweighting framework for all in-term assessments. Academic Consideration requests are not required and will not be accepted for missed midterms, quizzes, tutorials, assignments, or other in-term assessments.

Midterm tests: If a student misses a midterm test, its weight automatically shifts to the final examination. In addition, if the student's final examination grade exceeds their midterm grade, the weight of that midterm will automatically be transferred to the final examination.

Tutorials: Students are expected to complete at least 9 of 12 tutorials. Missed tutorials do not require Academic Consideration. Tutorial grades will be calculated from completed tutorials as described above.

Quizzes: Students are expected to complete at least 8 of 12 quizzes. Missed quizzes do not require Academic Consideration. Quiz grades will be calculated from completed quizzes as described above.

Late work: All take-home assessments include an automatic 48-hour no-late-penalty period. After this period no further submissions will be accepted.

Midterms and Tests

This course has 2 midterm 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 reweighing 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 reweighing described above.

Weekly Quizzes

This course has 12 quizzes. Students are expected to complete 8 of 12 to receive full credit for this component. If they miss up to 4 of these, they do not need to request Academic Consideration; the missing item(s) will not count against them, and their grade for this component will be calculated from their best 8 submissions.

If a student completes fewer than 8 of the total, the missing items will be recorded as a zero and included in their grade for this component. They are encouraged to submit all work, even if incomplete, since a partial mark is always better than a zero. If their final exam grade is higher than their grade on this component, their final exam grade will replace it.

Weekly Tutorials

This course has 12 tutorials. Students are expected to complete 9 of 12 to receive full credit for this component. If they miss up to 3 of these, they do not need to request Academic Consideration; the missing item(s) will not count against them, and their grade for this component will be calculated from their best 9 submissions.

If a student completes fewer than 9 of the total, the missing items will be recorded as a zero and included in their grade for this component. They are encouraged to submit all work, even if incomplete, since a partial mark is always better than a zero. If their final exam grade is higher than their grade on this component, their final exam grade will replace it.

Deadlines: The 48-Hour No-Late-Penalty Period

All take-home assignments, quizzes, and labs with a stated due date include an automatic 48-hour period after the deadline during which students may still submit without a late penalty. For example, if an assignment is due on November 5, they may submit it until November 7 without penalty. After this 48-hour period, no further submissions will be accepted, and students do not need to request Academic Consideration for a missed deadline; their grade for this component will be calculated as described above.

Academic Consideration for Final Examinations

Academic Consideration requests with supporting documentation are required only for final examinations scheduled during the official examination periods.

Students must familiarize themselves with the *University Policy on Academic Consideration – 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](#).

For procedures on how to submit Academic Consideration requests, please see the information posted on the Office of the Registrar's webpage: https://registrar.uwo.ca/academics/academic_considerations/. All requests for Academic Consideration must be made within 48 hours after the assessment date or submission deadline.

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 appeal to 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](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, tutorials, quizzes, 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.

Use of Software for Assessments

Computer-marked multiple-choice tests and exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

During the course, we might use Personal Response Systems such as iClickers. If these systems are used, the collected data will not be used to assess the student. IClickers collects the date, responses and the name of the student. The course instructor will use the data for statistics and improvement of the course. Conclusions drawn from the data will only be communicated in an anonymous manner (e.g. how did students perform that engaged with iClicker questions compared to students who did not). Responses submitted through a personal response system must be submitted only by the student registered in the course. Students may not submit responses on behalf of another student.

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>) and the Science Students' Council (<https://www.westernssc.ca>).