

Physics 1302B - Introductory Physics II

Course Information: Winter 2021

1. Course Description

A calculus-based introductory course in physics covering the principles of fluid statics and dynamics, electric fields and potential, capacitance, DC circuits, magnetic fields, electromagnetic induction, oscillations and waves.

Prerequisite(s): One of Physics 1301A/B, 1401A/B or 1501A/B, or a minimum mark of 70% in Physics 1028A/B, or permission of the Department.

Antirequisite(s): Physics 1021, 1029A/B, 1502A/B, the former Physics 1020, 1024, 1026.

Note: It is the student's responsibility to ensure that all pre-requisite and anti-requisite conditions are met or that special permission to waive these requirements has been granted by the Faculty. Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you will be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

2. Course Objectives & Learning Outcomes

The aim of this course is not only to gain a fundamental 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:

- provide a coherent microscopic description of fluids and electric and magnetic phenomena and use these to generate macroscopic laws.
- extend and apply Newton's Laws of Motion and the principle of conservation of energy to phenomena involving fluids, electromagnetism, oscillations and waves.
- use periodic functions to quantify the displacement, velocity, acceleration, and energy in simple harmonic oscillations and waves.
- 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 physical sense.
- 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.

By the end of the course, students will be expected to meet the more specific learning outcomes identified in the course document Learning Objectives and Outcomes. Use that document as a checklist to ensure complete coverage and understanding of the required topics or skills.

3. Instructional Team

Instructors: Dr. Jan Cami (Course Coordinator)
Dr. Eugene Wong
Dr. Maryam Tabeshian

Course Administrator: Dr. Maryam Tabeshian

Contact Info: Please use phys1302@uwo.ca for course-related administrative issues. Allow 2—3 working days for a response from the instructors or course administrator. For all physics-related questions, please use the OWL Forum, Help Centre or Perusall Chat forum. Students must use their Western (@uwo.ca) e-mail addresses when contacting the course instructors. Other e-mail addresses will be automatically filtered out. Please refrain from using the instructors' personal e-mail addresses for course-related inquiries.

Office Hours: Thursday, 3:00pm—4:00pm, Zoom (link through OWL)

Lab Instructor: Please contact Dr. Shailesh Nene (physlab1@uwo.ca) for all concerns related to the labs.

4. Course Delivery

All components of this course will be online for Winter 2020-2021.

The Course OWL site (at <http://owl.uwo.ca/>; course PHYSICS1302B 001 FW20) is the main launch platform for all course components, including the labs.

Most course components are offered asynchronously, meaning that students are expected work through them at their own pace, and with proper planning given due dates. There will be regular opportunities for direct and synchronous interaction with the course instructors and TAs through Help Centres and Office Hours; these are also accessed through OWL.

The course material is divided into 5 units that are further subdivided into topics. For each topic, there will be assigned textbook readings, videos with demonstrations, lectures and worked out example problems, and assignments. The “Getting Started” tab will introduce each of the tools and platforms that are used in this course.

5. Course Materials & Tools

The required course materials can be obtained from the Western Bookstore. Specifically, you will need the e-book package (e-Text + access code for the Mastering Physics platform) as well as an access code for the laboratory manual. The e-book package is the same as for the Fall term courses Physics 1028 and Physics 1301, and there is no need to purchase the package again if you already have it. The laboratory manual however is different from the Fall term.

- Textbook:** The required textbook is *Sears & Zemansky's College Physics*, 11th edition, by Young & Adams, (Pearson, 2020). We will use the e-book for assigned course readings (on Perusall, see below), so other editions or textbooks cannot be used. You may order a hardcopy of the textbook separately for an additional fee, but this is not required.
- Mastering Physics:** The e-book package for Physics 1302 also contains an access code for Mastering Physics, the accompanying on-line learning platform that we will use for some assignments. You will need that access code to create an account on Mastering Physics, using your Western (@uwo.ca) e-mail address. If you do not use your Western e-mail address, you will receive no grades for assignments and quizzes. If you already have an account that you used for the Fall term, you will need to use the same login as in the Fall term. Once logged in, you should be able to add this course (course ID **cam179008**) without requiring any more access codes.
- Lab Manual:** Separately from the e-book package, you require a Physics Laboratory Manual for Physics 1029B/1302B. The manual is offered on Perusall as well, and the bookstore package will provide you with the proper access code. Be sure to buy the correct package, as it is not refundable.
- Perusall:** A portion of the class marks will be assigned for performing the assigned course readings and engaging with the material and fellow students (by posting and responding to comments and questions) on the Perusall web site. You can access this site from the course OWL site, and students should not have to create a separate Perusall account.
- OWL:** The OWL course site is the primary method by which course content will be made available to students in class and by which instructors will provide important information and updates about course components and evaluations. Students are responsible for checking OWL on a regular basis. If students need assistance, they can contact the Western Technology Services Helpdesk. They can be contacted by phone at 519-661-3800 or ext. 83800.
- Gradescope:** Lab worksheets are to be submitted via Gradescope. Please use the Gradescope link on OWL to do so.

6. Course Evaluation

Your final grade in this course will be derived according to the following scheme:

Textbook Readings & Discussions		10%
Assignments		15%
	Group Assignments	10%
	Mastering Physics Assignments	5%
Laboratories		9%
Tests & Exams		66%
	Quizzes	24%
	Midterm Exam	17%
	Final Exam	25%
TOTAL		100%

Textbook Readings & Discussions: There are 5 assignments on Perusall – one for each of the content units – that are each worth 2%.

Group Assignments: Three (3) group problem solving assignments (worth 3% each) will be scheduled throughout the term. Each of the assignments consists of 2 components:

1. **Creation Phase** (2%): create a 3–5 minute video that explains the concepts, problem-solving strategy and presents the full solution to a problem from the pool of practice questions on Mastering Physics or from the textbook’s end-of-chapter problems.
2. **Feedback Phase** (1%): Provide evaluative comments on 3 or more videos from other groups and your peers within your group.

To participate in the Group Assignments, you will first need to complete the Initial Setup & Charter Assignment (worth 1%). If you do not complete this, you will forfeit all 10% of the grades associated with the Group Assignments.

Mastering Physics Assignments: There will be 5 conceptual assignments on Mastering Physics that will help you gain a deeper understanding of the course physics concepts. These will include 4 “Dynamic Study Modules” about the course concepts. Each of these assignments is worth 1%, and you will have unlimited attempts to complete them. Please see the course schedule for due dates.

Mastering Physics Practice Problems: On Mastering Physics, you will also find recommended practice problems from the textbook for each unit. These are not graded and have no due date. We recommend that you work on these problems early on and not leave them until right before quizzes or exams.

Laboratories: Students are required to complete all 3 scheduled labs (each worth 3%), accessible via the corresponding tabs on OWL. To accommodate covid-19 restrictions, all labs will be virtual, and are completed using data that have already been collected for you. For each of the labs you should:

1. Read the corresponding sections in the lab manual (on Perusall).
2. Complete the pre-lab quiz on OWL. These pre-lab quizzes are a replacement for submitting the pre-lab worksheets. You need a quiz score of at least 75% on the pre-lab quiz, and you have

unlimited attempts to complete the pre-lab quiz. If do you not score 75% or more on the pre-lab quiz, you will not be able to download the lab worksheet, **and** you will receive a 0 on the lab.

3. Download the lab worksheet and fill it out either electronically or by printing, completing and scanning it for submission via the Gradescope link on OWL.

Please direct all lab-related questions to the lab instructor, Dr. Shailesh Nene (physlab1@uwo.ca).

Quizzes: Over the course of the term, there will be 4 quizzes to test your understanding of the course concepts. These quizzes will focus on conceptual questions with a minor component on calculations. Working through the course material and Dynamic Study Modules would be a good preparation for these quizzes. Each quiz is worth 6% and will be administered through Mastering Physics. You will have a set time to complete a quiz once you have started. Communicating contents of the quizzes to others in any fashion (verbally, via social media, email, printouts, or any other means) is considered cheating; see 8.B below regarding cheating. Note that there will be no makeup quizzes.

Midterm and final exams will emphasize problem solving questions in addition to conceptual questions. Note that Midterm and Final Exams cover material from lectures, labs and assignments.

Midterm Examination: The midterm exam will be online on **Wed March 10th 2021** and may be monitored using ProctorTrack.

Final examination: The final exam will be online and may be monitored using ProctorTrack. The date and time will be determined and announced by the Office of the Registrar.

Grades: All scores will be posted in the Gradebook on the course OWL site. Any errors, or appeals to your scores, must be reported to your instructor (via phys1302@uwo.ca) **within two weeks** of their initial posting. Please note that:

- your *final exam* mark will only be posted to OWL after the end of the exam period
- your *final course grade* must come officially from the Registrar's Office and will not be posted on OWL, and
- *final course grades* may need to be adjusted in order to conform to department policy.

7. Accommodation and Accessibility

Please refer to the UWO Academic Policies http://www.uwo.ca/univsec/academic_policies/ for further details on the policies in practice here.

Accommodation Policies — Students with disabilities should work with Western's Accessible Education (formerly SSD), which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The Academic Accommodation for Students with Disabilities policy can be found at:

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

Academic Consideration for Student Absences and Illness — If you are unable to meet a course requirement due to illness or other serious circumstances, you must seek approval for the absence as soon as possible. Approval can be granted either through (1.) a self-reporting of absence or (2.) the Dean's Office/Academic Counselling unit of your Home Faculty.

1. Self-reported Absence: Students who experience an unexpected illness or injury or an extenuating circumstance (48 hours or less) that is sufficiently severe to temporarily render them unable to meet academic requirements (e.g., attending lectures or labs, writing tests or midterm exams, completing and submitting assignments, participating in presentations) should self-declare using the online Self-Reported Absence portal. This option should be used in situations where the student expects to resume academic responsibilities within 48 hours or less.

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the semester, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

2. Faculty of Science Academic Counselling Help Portal:

<https://help.sci.uwo.ca/servicedesk/customer/portal/3/user/login?destination=portal%2F3>

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. *All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a **student's Home Faculty**.*

For policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs, see:

www.uwo.ca/univsec/pdf/academic_policies/appeals/Academic_Consideration_for_absences.pdf and

for the Student Medical Certificate (SMC), see:

www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Religious Accommodation — Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar:

<https://multiculturalcalendar.com/ecal/index.php?s=c-univwo>

8. Academic Policies

The website for Registrarial Services is www.registrar.uwo.ca. In accordance with policy, www.uwo.ca/its/identity/activatenonstudent.html, the centrally administered e-mail account provided to students will be considered the individual's official university e-mail address. It is the responsibility of the account holder to ensure that e-mail received from the University at his/her official university address is attended to in a timely manner.

A) **Make-up Policy:**

- a) *Perusall reading assignments* – There are 5 reading assignments that cover 5 topics, and no make-up Perusall reading assignments will be given. However, the due dates on the reading

assignments are “Best Before” dates. If you miss a reading assignment, you can complete it after the due date without incurring a penalty. However, since you then may miss interactions with fellow students, it may be harder to receive full marks. The last date to submit these assignments is the last day of classes, April 12, 2021.

- b) *Mastering Physics Assignments* – Five sets of conceptual assignments will be available on Mastering Physics over the course term. No make-up assignments will be given. The due dates on the Mastering Physics assignments are “Best Before” dates. If you miss an assignment, you can complete it after the due date without incurring a penalty. No make-up Mastering Physics assignments will therefore be given. The last date to submit these assignments is the last day of classes, April 12, 2021.
- c) *Group Assignments* – There will be no makeup opportunity for missed group assignments. If you miss the group creation component (2%), you automatically forfeit the feedback component of the grade (1%) as well. If you have accommodation for missing a group assignment, its grade will be shifted to the final exam.
- d) *Labs* – All labs must be completed, and no makeup labs are offered. An incomplete lab will be recorded as a zero and included in your lab average score.
- e) *Quizzes* – All 4 quizzes count toward your final grade, and no makeup quizzes will be offered. If you have accommodation for a missed quiz before the midterm, its grade will be shifted to the midterm. Similarly, if you have accommodation for a missed quiz after the midterm, its grade will be shifted to the final exam.
- f) *Midterm* – One midterm will be offered on Wednesday March 10th, 2021. The makeup date for the midterm is Saturday March 13th, 2021.
- g) *Final Examination* – In accordance with Senate Policy, a Special Examination will be held within thirty days of the regular final examination for students who were unable to write the regular examination for medical or other documented reasons. Requests for such a Special Examination must be made to the Associate Dean, Faculty of Science via an Academic Counsellor. Note that if you fail to write the scheduled Special Examination, permission to write another Special Examination will be granted only with the permission of the Dean in exceptional circumstances and with appropriate supporting documents. In such a case, the date of this Special Examination normally will be the scheduled date for the final exam the next time the course is offered (e.g. the following April for this course).

If you are unable to meet a course requirement due to illness or other serious circumstances, you must provide valid medical or other supporting documentation to the Dean's office as soon as possible and contact your instructor immediately. It is the student's responsibility to make alternative arrangements with their instructor once accommodation has been approved and the instructor has been informed. In the event of a missed final exam, a "*Recommendation of Special Examination*" form must be obtained from the Dean's Office immediately. For further information, see

http://www.uwo.ca/sci/undergrad/academic_counselling/.

B) **Cheating and Plagiarism**

“Success (and failure) will come and go, but integrity is forever” - Amy Rees Anderson

University Policy states that cheating, including plagiarism, is a major scholastic offence. Scholastic offences are taken seriously, and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following: www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

The commission of a scholastic offence is attended by academic penalties that might include expulsion from the program. If you are caught cheating, there will be no second warning.

As per the UWO Academic Policies:

- Plagiarism: Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt both by using quotation marks where appropriate and by proper referencing, such as footnotes or citations.
- All required papers may be subject to submission for textual similarity review to the commercial plagiarism-detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between The University of Western Ontario and Turnitin.com (<http://www.turnitin.com>).
- Computer-marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

C) **Online Course Conduct & Netiquette:**

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

Only students using their UWO credentials will be permitted to access the course elements. If, for privacy reasons, you wish to use a pseudonym, you must have the pseudonym pre-approved by the course coordinator before being allowed to participate in any online component.

If you are experiencing any online harassment or bullying through the course platforms, report the behaviour immediately to the course coordinator. Perusall has a built-in option to flag an inappropriate comment (look for the exclamation icon), with automatic notification sent to the instructors.

Anyone posting inappropriate content or abusing the option to flag inappropriate content will be banned from further interactions, which eliminates any further grades or marks related to the collaborative platforms.

General considerations of “netiquette”:

- Use your computer and/or laptop if possible (as opposed to a cell phone or tablet).
- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Use proper grammar and spelling. Cite the ideas of others appropriately.

D) **Remote Proctoring Software** Tests and examinations in this course will be conducted using the remote proctoring service, Proctortrack. By taking this course, you are consenting to the use of this software and acknowledge that you will be required to provide **personal information** (including some biometric data) and the session will be **recorded**. More information about this remote proctoring service is available in the Online Proctoring Guidelines at the following link:

<https://www.uwo.ca/univsec/pdf/onlineproctorguidelines.pdf>

Completion of this course will require you to have a reliable internet connection and a device that meets the technical requirements for this service. Information about the technical requirements are available at the following link: <https://www.proctortrack.com/tech-requirements/>

- E) **Complaints and Suggestions:** If you have a concern about something, please let us know. We rely on your feedback. Please contact initially the person most directly concerned – this will usually be your instructor. If that is not satisfactory, or if there is something more general bothering you, talk it over with the Physics & Astronomy Department Chair or the Associate Chair of Undergraduate Affairs (for contact information see <http://www.physics.uwo.ca>).

9. Support Services

Accessibility — Please contact the course instructor if you require lecture or printed material in an alternate format or if any other arrangements can make this course more accessible to you. You may also wish to contact Student Accessibility Services (SAS) at (519) 661-2147 if you have any questions regarding accommodations.

Western University is committed to a thriving campus as we deliver our courses in the mixed model of both virtual and face-to-face formats. We encourage you to check out the Digital Student Experience website to manage your academics and well-being: <https://www.uwo.ca/se/digital/>.

Counseling — Please visit the Science & Basic Medical Sciences Academic Counselling webpage for information on add/drop courses, academic considerations for absences, appeals, exam conflicts, and many other academic related matters: <https://www.uwo.ca/sci/counselling/>

Learning Skills — Learning-skills counsellors at the Student Development Centre (www.sdc.uwo.ca) are ready to help you improve your learning skills. They offer presentations on 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.

Mental Health — Students who are in emotional/mental distress should refer to Mental Health@Western (www.health.uwo.ca/mental_health) for a complete list of options about how to obtain help.

Science Student Donation Fund — This course gratefully acknowledges support from the Science Student Donation Fund. If you are a B.Sc. or B.M.Sc. student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you contribute to the Science Student Donation Fund, which is administered by the Science Students' Council (SSC). One or more grants from the Fund have allowed for the purchase of lab equipment integral to teaching this course. However, you may opt out of the Fee by the end of September of each academic year by completing the online form linked from the Faculty of Science's Academic Counselling site. For further information on the process of awarding grants from the Fund or how these grants have benefitted undergraduate education in this course, consult the chair of the department or email the Science Students' Council at ssc@uwo.ca. In the front pages of your lab manual, you will find examples of some the lab equipment partially funded through the Science Student Donation Fund.

Student Council — Additional student-run support services are offered by the USC, westernusc.ca/your-services/#studentservices

Document versions:

- v1.0, Jan 2021: First version.
- V1.1: Jan 9, 2021.