

1. Course Information

Physics 1502: Enriched Introductory Physics II

Winter 2021

Hours: 9:30-10:30am Mondays & Fridays (online synchronous activities); Mondays 2:30-5:30 (labs; online or in-person) or 3:00-5:00 (tutorials; online synchronous)

Antirequisite(s): Physics 1021, 1029A/B, 1302A/B, 1402A/B.

Prerequisite(s): One of Physics 1501A/B (preferred) or Physics 1301A/B or 1401A/B, or a minimum mark of 80% in Physics 1028A/B; Calculus 1000A/B or 1100A/B or 1500A/B.

Corequisite(s): Calculus 1501A/B (preferred) or Calculus 1301A/B, or Applied Mathematics 1413.

Extra Information: 3 lecture hours, 3 laboratory/tutorial hours, 0.5 course.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may 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. Instructor Information

Instructor: Prof. Sarah Gallagher (sgalla4@uwo.ca).

Teaching assistant: Kaylie Green (kgreen94@uwo.ca). Kaylie will be doing most of the marking, and should be contacted first for technical issues about the course.

Students must use their Western (@uwo.ca) email addresses when contacting their instructor or TA by email. We will also be using MS Teams for the course, and direct messaging or chat on Teams will be the preferred method for contacting the instructor after the first MS Teams synchronous activity.

Office Hours: Drop-in office hours will be held on 9:30-10:30am on Mondays on MS Teams (see the *Getting Started* tab on OWL for instructions).

3. Course Syllabus, Schedule, Delivery Mode

Brief Course Outline ([Topic. Textbook sections.](#))

1. Electric effects. [Chapters 21–26.](#)
2. Magnetic effects. [Chapters 27–30.](#)
3. Oscillations and waves. [Chapters 14–16.](#)
4. Relativity. [Chapter 37.](#)
5. Nuclear interactions and particles. [Chapter 44.](#)

Course-Level Learning Outcomes

By the end of this course, students should be able to:

- use mathematical language at the level of calculus to solve analytic and quantitative problems in the general topics of electricity & magnetism and oscillations & waves.
- extend and apply Newton's Laws of Motion and the principle of conservation of energy to electromagnetic and wave phenomena.
- develop a coherent microscopic description of electric and magnetic phenomena and use these to generate macroscopic laws.
- use periodic functions to quantify the displacement, velocity, acceleration, and energy in simple harmonic oscillations and waves.
- use the Lorentz transformations to quantify relativistic effects of objects traveling close to the speed of light.
- explain nuclear stability and nuclear processes including fission and fusion.
- 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.
- 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.
- continue in all physical science modules at the second year level with a solid background.

Detailed course learning outcomes associated with each topic will be posted to the course OWL site.

Weekly schedule:

Mondays (9:30-10:30am): Synchronous on-line office hours (optional; synchronous on Teams)

Mondays: Lab (asynchronous) and tutorial sessions (synchronous on Teams; 3:00-5:00pm) will alternate.

Wednesdays (9:30-10:30am): Bi-weekly Mastering Physics assignments will be due *or* a short online quiz will occur posted on OWL, answers and work uploaded to Gradescope.

Fridays (9:30-10:30am): Live problem-solving sessions (synchronous on Teams)

Sessional dates:

Classes begin: January 11, 2021

Reading Week: February 13-21, 2021

Classes end: April 14, 2021

4. Course Materials

Textbook: The required textbook is the online version of *University Physics with Modern Physics*, 15th edition, by H. D. Young and R. A. Freedman (Pearson) available from the Western Bookstore. The e-textbook will be required for some of the course readings so other editions or textbooks cannot be substituted. A paper copy of the textbook may be ordered separately for an additional fee but is not

required. Also required is purchasing access to the MasteringPhysics website. The textbook and MasteringPhysics will be available from the Western bookstore as a single bundle: information on how to purchase the textbook and MasteringPhysics access will be posted on the course website. **If you have already purchased the book and access code for the Fall term, you do not need to buy it again.**

MasteringPhysics: The textbook publisher provides a web-based instructional platform called MasteringPhysics which is required for this course. A portion of the class marks will come from Mastering Physics assignments. Access to MasteringPhysics will be included with your textbook if you buy it (or have already bought it for last term) through the Western bookstore.

Students will need to set up an account on MasteringPhysics, and will need two pieces of information to do so: the course ID is **Physics1502B_UWO_GALLAGHER_2021** and the UWO student identifier from your UWO email (for example, if your email is jsmith22@uwo.ca then your student ID is jsmith22). Students should log into <https://www.pearson.com/mastering> and create an account with their student ID and join the course ID above. (If you already have an account, you just need to join the new course.) Using an account with an incorrect login ID may result in your grades not linking properly with the university grade book.

Perusall: A portion of the class marks will be assigned for performing the readings and engaging with the material and fellow students (by posting and responding to comments) on the Perusall website on a weekly basis. This is done via the Perusall tool which will be accessible from the course OWL site. Students do not have to create a separate Perusall account. A rubric for evaluating Perusall contributions will be posted on the course OWL site.

MS Teams: Weekly office hours (Mondays 9:30-10:30am) and problem-solving sessions (Fridays 9:30-10:30am) will be held synchronously (that is, students and instructor will all log in at the same time) via MS Teams. The Friday sessions will be recorded and posted to the class MS Teams channel. A link will be provided to the first Teams meetings via OWL; after the initial meetings students will be expected to check the course Teams channel regularly for course communications. The MS Teams app should be downloaded and installed, and your Western userid and password should be used to login.

Gradescope: Students handwritten work for the bi-weekly quizzes will be submitted Gradescope linked through OWL; the course code is **9B4BZ9**. Gradescope will accept scans or photos of handwritten pages. These will be accessed by the TA to grade, and marks and feedback will be returned to the student via Gradescope.

OWL: The schedule and links to the online materials for the course will be posted to the course OWL website. Students should check OWL (<http://owl.uwo.ca>) on a regular basis for news and updates. This is the primary method by which course content will be disseminated to all students in the class. Students are responsible for checking OWL on a regular basis.

If students need assistance, 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.

Technical Requirements: Students will need a stable internet connection and a device with a functioning microphone and webcam to participate in the course. Software required for the course includes MS Teams and MS Excel (available for free to Western students); websites include owl.uwo.ca, <https://www.pearson.com/mastering/>, and gradescope.ca. Information about the system requirements for MS Teams is available at the following link:
<https://docs.microsoft.com/en-us/microsoftteams/hardware-requirements-for-the-teams-app>

5. Methods of Evaluation

Grading:

Quizzes (OWL and Gradescope; best 4 of 5): 35%
Assignments (MasteringPhysics; best 5 of 6): 15%
Tutorial participation (MS Teams): 20%
Readings (Perusall; best 10 of 12): 20%
Laboratories (online or in-person): 10%

Note: in order to pass this course, you must obtain (1) a grade of at least 50% over all course components AND (2) a grade of at least 50% on the laboratories. If you fail to obtain a grade of 50% on either one, this failing grade will be adopted as your final course grade.

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

Last date of assignments: There is no final examination for this course. The last day for work to be submitted is the last day of classes, April 14, 2021.

Tutorials: The purpose of tutorials is for you to get to know and engage with the instructor and your classmates, and to develop a more hands-on and conceptual understanding of the course material. There will be six tutorial sessions (scheduled Mondays 3:00-5:00pm throughout the term) synchronously via MS Teams. Participation marks will be assigned for each tutorial session. The nature of participation will vary from week to week, and may include comments posted in the MS Teams channel, online assignments, preparation of group videos, or tutorial presentations. Further details on the evaluation of tutorial participation will be provided before each session.

Accommodated Evaluations: The marks for quizzes and MasteringPhysics will be calculated based on the best n-1 of n possible marks for each type of evaluation. As a result, there will be no make-ups for missed quizzes or MasteringPhysics assignments. Exceptional circumstances (such as an extended illness) will be addressed on a case-by-case basis.

Other lab information: There are different first year laboratory manual packages which can be purchased from the Western bookstore. Information on how to purchase the Lab Manual will be posted on the course OWL website. Note that Physics 1502B has the same package as 1402B but it is different from Physics 1029B and 1302B. Make sure you buy the correct laboratory package because it is not refundable.

Laboratories: *In order to pass the course, you must pass the laboratory component!*

Labs can be completed either in-person or online. There are four labs this semester. If you are doing the labs online, you will do all four of them online. If you are doing the labs in person, you will do two of the labs online, and two in-person. The availability of in-person labs will depend on student interest and the public health situation at the time when they are scheduled. If there are not enough students interested in in-person labs, then all labs will be online.

In-person labs: In-person labs will be held Mondays, 2:30-5:30pm in the Materials Science Addition (MSA) Building if they occur. The Physics 1502B laboratory timetable will be posted on the course OWL site under the Lab menu item. You must find your correct lab section, lab subsection, and the correct laboratory timetable before attending the first lab. We do not give permission to attend lab classes outside of your laboratory schedule.

Online labs: See the course OWL site for more information

6. Accommodation and Accessibility

Accommodation Policies: Students with disabilities work with 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 Absence: 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

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

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:

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

and for the Student Medical Certificate (SMC), see:

http://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>

You may also be eligible to write the Special Exam if you are in a "Multiple Exam Situation" (see

http://www.registrar.uwo.ca/examinations/exam_schedule.html).

If a student fails to write a scheduled Special Examination, the date of the next Special Examination (if granted) normally will be the scheduled date for the final exam the next time this course is offered. The maximum course load for that term will be reduced by the credit of the course(s) for which the final examination has been deferred. See Academic Calendar for details (under [Special Examinations](#)).

7. Academic Policies

The website for Registrarial Services is <http://www.registrar.uwo.ca>.

In accordance with policy, <http://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.

Contingency plan for an in-person class pivoting to 100% online learning: In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor. The only activities affected by this would be in-person labs.

Professionalism and netiquette: It is expected that students will display the same standard of behaviour in all online interactions as they would in the regular classroom. Video interactions will be done in respectful language, in a quiet environment, without the presence of non-class members in the background, in appropriate clothing, etc. Failure to abide with these requirements may result in the barring of the student from such interactions and the loss of any associated marks. For a refresher on netiquette see <https://www.rasmussen.edu/student-experience/college-life/netiquette-guidelines-every-online-student-needs-to-know/>

The integrity of the course and the privacy of its participants is expected to be preserved. It is illegal to distribute, share in any public domain, or sell any course materials without prior written consent of the instructor.

Some of the remote learning sessions for this course will be recorded. The data captured during these recordings may include your image, voice recordings, chat logs and personal identifiers (name displayed on the screen). The recordings will be used for educational purposes related to this course, including evaluations. The recordings may be disclosed to other individuals participating in the course for their private or group study purposes. Please contact the instructor if you have any concerns related to session recordings.

Participants in this course are not permitted to record the sessions, except where recording is an approved accommodation, or the participant has the prior written permission of the instructor.

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 Web site: http://www.uwo.ca/univsec/pdf/academic_policies/appeals/scholastic_discipline_undergrad.pdf.

Procedures for quizzes: Remote bi-weekly quizzes will not be proctored, but students must write and sign an honour statement for each quiz that they have not used resources that are not permitted for the quiz. The questions for the quizzes will be posted on OWL during a specified time, and then students will upload their work (including the signed honour statement) to Gradescope for marking.

8. Support Services

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/>

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/>.

Learning-skills counsellors at the Student Development Centre (<http://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.

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

Additional student-run support services are offered by the USC, <http://westernusc.ca/services>.

This course is supported by the Science Student Donation Fund. If you are a BSc or BSc student registered in the Faculty of Science or Schulich School of Medicine and Dentistry, you pay the Science Student Donation Fee. This fee contributes 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 equipment integral to teaching this course. 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.