

PHYS 130: Physics II

January - April 2026

Instructor: Prof. Michel Lefebvre

Email: lefebvre@uvic.ca

Web: <https://www.uvic.ca/science/physics/vispa/people/faculty/lefebvre.php>

Office Hours: See [Brightspace](#) site.

Lectures: 13:30 - 14:20, Tuesdays, Wednesdays, and Fridays

First lecture: Tuesday 6 January 2026

Course Webpage: [Brightspace](#)

This course will be fully conducted in a synchronous teaching model — this means all lectures, labs, midterm exams, and the final exam will be at fixed times and in person. This is an enriched course intended for students considering a degree in Physics and Astronomy. Last day for dropping courses without penalty of failure is **Sat 28 Feb 2026**.

Abstract (from Academic Calendar)

Rotational and simple harmonic motion; wave motion and sinusoidal waves; reflection, refraction, and interference; optics; sound and the Doppler effect; de Broglie waves and the hydrogen atom; if time allows, radioactivity and principles of quantum mechanics.

Prerequisites: PHYS 120 - Physics I

Pre- or co-requisites: MATH 101 - Calculus II

Text: University Physics (OpenStax)

<https://openstax.org/details/books/university-physics-volume-1>

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

Assignments

Approximately 9 assignments, solutions to be uploaded on [Brightspace](#).

Labs

Labs start the week of 5 January with an introduction. You will be given scheduling information at the first lab. There will be no labs during Reading Break (16-20 Feb).

Section B01, Mon 14:30 - 17:20: lab instructor: Negar Seif <negarseif@uvic.ca>

Section B02, Tue 14:30 - 17:20: lab instructor: Alex Schmid <aschmid@uvic.ca>

Section B03, Wed 14:30 - 17:20: lab instructor: Negar Seif <negarseif@uvic.ca>

Please do not hesitate to contact your lab instructor if you have any issues with the labs.

Midterm Exams

There will be two 50-minute midterm exams held during class time:

Midterm Exam 1: Friday 13 February

Midterm Exam 2: Friday 13 March

There are no supplemental or make-up midterms.

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Final Exam

The final exam will be 3 hour long and held during the April exam period. The date is centrally scheduled, and normally finalized in late February. **You must write the final exam to obtain credit for this course.**

Topics covered in the course

[University Physics Volume 1:](#)

- Chapter 10: Fixed Angular Rotation
- Chapter 11: Angular Momentum
- Chapter 13: Gravitation
- Chapter 15: Oscillations
- Chapter 16: Waves
- Chapter 17: Sound

[University Physics Volume 3:](#)

- Chapter 1: The Nature of Light
- Chapter 2: Geometric Optics and Image Formation
- Chapter 6: Photons and Matter Waves
- Chapter 7: Quantum Mechanics
- Chapter 10: Nuclear Physics (if time permits)

More details below.

Assignments assessment

There will be approximately 9 assignments, **handwritten** solutions to be uploaded on Brightspace as **one** PDF file; these can be solutions written on paper and then scanned, or a file produced using a tablet computer. **Look at your PDF file before uploading it onto Brightspace** to ensure the scan quality is good, the pages are in the correct order, and questions are properly labelled.

Assignment Policy:

- You are allowed to collaborate on assignments, so long as your work and your solutions are your own.
- You are expected to treat your assignments with respect. Assignments that are disorganized or difficult to read will receive reduced marks at the marker's discretion.
- Late assignments are not accepted, the deadline will be strictly enforced.
- **The two lowest grade assignments will not be used towards your final grade.**

Labs assessment

To obtain credit for the course, you must complete **all labs** and receive an overall grade of at least 50% in the lab component. No lab reports will be accepted after 2 Apr 2026.

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Grading Scheme

To obtain credit in the course you must:

- have a satisfactory grade (usually at least 40%) on the final exam.
- complete all labs and have a final lab grade of at least 50%.
- have at least 50% on your final course grade, which is the highest one obtained from the following two grading schemes:

	I	II	
Assignments	10%	10%	approximately 9 assignments
Labs	20%	20%	final lab grade must be 50% or higher
Midterm 1	15%	10%	50 min exam, during class time, Fri 13 Feb
Midterm 2	15%	10%	50 min exam, during class time, Fri 13 Mar
Final exam	40%	50%	3 hour exam, April exam period.

If the application of this scheme would result in grades that are judged by the instructor to be inconsistent with the [University's grading descriptions](#), then the instructor will assign percentages consistent with them.

Notwithstanding the weighting and procedure explained above:

- "E" grade is not offered in this course.
- If you do not write the final exam you will be assigned an "N".
- If you have not submitted all lab reports you will be assigned an "N".
- If you have less than 50% on the labs you will be assigned an "F".
- If you exhibit inadequate performance on the final exam you will be assigned an "F".
- A maximum course grade of 49% will be assigned to "N" and "F" grades.

Note that "N" and "F" grades are failing grades and factor into the GPA as a value of 0.

Accommodation

Arrangement for reasonable accommodations **for customarily accommodated issues** (such as illness or family affliction) will be considered, however this is contingent on your active participation: if you miss a course requirement, you are expected to contact the instructor as soon as reasonably possible, and you are expected to give the instructor **advance warning** of issues that you could have reasonably foreseen.

Familiarize yourself with UVic's [Undergraduate requests for academic concession](#), [academic concessions regulations](#) and [guidelines](#).

Missing one or both midterms for accommodated issues:

- If you miss one midterm for issues that can be accommodated, your other midterm will have a weight of 15% and your final exam will have a weight of 55%.
- If you miss both midterms for issues that can be accommodated, you will be given the opportunity to write an exam to replace one midterm with a weight of 10% near the end of the term, and your final exam will have a weight of 60%.

Missing assignments for accommodated issues:

- If you miss **more than two** assignments for issues that can be accommodated, contact the instructor to discuss possible accommodation.

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Centre for Accessible Learning

The University of Victoria is committed to creating a learning experience that is as accessible as possible. If you are registered with the [Centre for Accessible Learning](#) (CAL) and anticipate or experience any barriers to learning in this course, please feel welcome to discuss your concerns with the instructor. If you are a student with a disability or chronic health condition, you can meet with a CAL advisor to discuss access and accommodations.

Conduct

Attendance of lectures is not required, but very strongly recommended. In Physics, a discipline norm is that **mastery** combines very good **comprehension** with the ability to **demonstrate** that comprehension under time pressure, such as in a timed exam situation. **Full engagement** with course activities includes attending lectures, submitting all lab reports, and submitting essentially all assignments.

University Regulations on Academic Integrity

Cheating, plagiarism, and other form of academic fraud are taken very seriously by the University and by the instructor. Please familiarize yourself with the University [Policy on Academic Integrity](#) and with the [Student Code of Conduct](#). Note that it is an academic integrity violation and a violation of UVic policies about information technology to post material from this class to any online “homework help” site.

Academic integrity requires commitment to the values of honesty, trust, fairness, respect, and responsibility. Any action that contravenes this standard, including misrepresentation, falsification or deception, undermines the intention and worth of scholarly work and violates the fundamental academic rights of members of our community.

Topics covered in the course — details

The course aims at covering the following content, from [University Physics Volume 1](#) and [University Physics Volume 3](#).

Items in red will be covered only if time permits.

Review: topics from V1 Chapters 1-9 and V3 Chapter 3

V1 Chapter 10: Fixed Angular Rotation

- 10.1 Rotational Variables
- 10.2 Rotation with Constant Angular Acceleration
- 10.3 Relating Angular and Translational Quantities
- 10.4 Moment of Inertia and Rotational Kinetic Energy
- 10.5 Calculating Moments of Inertia
- 10.6 Torque
- 10.7 Newton’s Second Law for Rotation
- 10.8 Work and Power for Rotational Motion

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V1 Chapter 11: Angular Momentum

11.1 Rolling Motion

11.2 Angular Momentum

11.3 Conservation of Angular Momentum

11.4 Precession of a Gyroscope

V1 Chapter 13: Gravitation

13.1 Newton's Law of Universal Gravitation

13.2 Gravitation Near Earth's Surface

13.3 Gravitational Potential Energy and Total Energy

13.4 Satellite Orbits and Energy

13.5 Kepler's Laws of Planetary Motion

13.6 Tidal Forces

13.7 Einstein's Theory of Gravity

V1 Chapter 15: Oscillations

15.1 Simple Harmonic Motion

15.2 Energy in Simple Harmonic Motion

15.3 Comparing Simple Harmonic Motion and Circular Motion

15.4 Pendulums

15.5 Damped Oscillations

15.6 Forced Oscillations

V1 Chapter 16: Waves

16.1 Traveling Waves

16.2 Mathematics of Waves

16.3 Wave Speed on a Stretched String

16.4 Energy and Power of a Wave

16.5 Interference of Waves

16.6 Standing Waves and Resonance

V1 Chapter 17: Sound

17.1 Sound Waves

17.2 Speed of Sound

17.3 Sound Intensity

17.4 Normal Modes of a Standing Sound Wave

17.5 Sources of Musical Sound

17.6 Beats

17.7 The Doppler Effect

17.8 Shock Waves

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V3 Chapter 1: The Nature of Light

- 1.1 The Propagation of Light
- 1.2 The Law of Reflection
- 1.3 Refraction
- 1.4 Total Internal Reflection
- 1.5 Dispersion
- 1.6 Huygens's Principle
- 1.7 Polarization

V3 Chapter 2: Geometric Optics and Image Formation

- 2.1 Images Formed by Plane Mirrors
- 2.2 Spherical Mirrors
- 2.3 Images Formed by Refraction
- 2.4 Thin Lenses

V3 Chapter 3: Interference

- 3.1 Young's Double-Slit Interference
- 3.2 Mathematics of Interference

V3 Chapter 4: Diffraction

- 4.1 Single-Slit Diffraction
- 4.2 Intensity in Single-Slit Diffraction

V3 Chapter 6: Photons and Matter Waves

- 6.1 Blackbody Radiation
- 6.2 Photoelectric Effect
- 6.3 The Compton Effect
- 6.4 Bohr's Model of the Hydrogen Atom
- 6.5 De Broglie's Matter Waves
- 6.6 Wave-Particle Duality

V3 Chapter 7: Quantum Mechanics

- 7.1 Wave Functions
- 7.2 The Heisenberg Uncertainty Principle
- 7.3 The Schrödinger Equation
- 7.4 The Quantum Particle in a Box
- 7.5 The Quantum Harmonic Oscillator
- 7.6 The Quantum Tunneling of Particles through Potential Barriers

V3 Chapter 10: Nuclear Physics (if time permits)

- 10.1 Properties of Nuclei
- 10.2 Nuclear Binding Energy
- 10.3 Radioactive Decay
- 10.4 Nuclear Reactions
- 10.5 Fission
- 10.6 Nuclear Fusion