

PHYS 130 - PHYSICS II
JANUARY 2017 - APRIL 2017

Instructor: Dr. Steeves

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Lectures: Tue., Wed., Fri.: 1:30 pm - 2:20 pm, Ell 167

Course website: <http://coursespaces.uvic.ca>

Abstract: 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; radioactivity and principles of quantum mechanics.

Text: University Physics, 14th edition, Young and Freedman (13th edition is acceptable). You need to access www.masteringphysics.com to complete the regular assignments. The required course-ID is: **MPSTEEVES77429**

Labs: All lab sections are held in the Elliott Lab Wing, room 128. Introduction week for all sections: January 9 - 13, 2017.

Office Hours: Elliott 116: Tue. 2:45 pm - 3:45 pm & Wed. 9:30 am - 10:30 am

Prerequisites: PHYS 120

Pre- or corequisite: MATH 101

Tours to local research institutions: This course may include tours to local physics research. This term we aim to visit at least two of the following three laboratories: 1) Vancouver Island Clinic of the B.C. Cancer Control Agency; 2) Dominion Astronomical Observatory, Herzberg Institute of Astrophysics; 3) Institute of Ocean Sciences and the Pacific Geoscience Centre.

Calculator: Sharp EL-510RNB (Available at bookstore for \$14.50).

Grading scheme: Final grades will be calculated based on the following two grading schemes. Your grade will be the higher of the two calculated grades:

	Scheme I	Scheme II
Assignments	15%	15%
Labs	15%	15%
Midterm #1	15%	10%
Midterm #2	15%	10%
Final Exam	40%	50%

Topics: University Physics, 14th edition, Young and Freedman Sections relevant to the lectures.

Chapter 3: Motion in Two or Three Dimensions

3.4: Motion in a Circle

Chapter 5: Applying's Newton's Laws

5.4: Dynamics of Circular Motion

Chapter 9: Rotation of Rigid Bodies

9.1: Angular Velocity and Acceleration

9.2: Rotation with Constant Angular Acceleration

9.3: Relating Linear and Angular Kinematics

9.4: Energy in Rotational Motion

9.5: Parallel-Axis Theorem

9.6: Moment-of-Inertia Calculations

Chapter 10: Dynamics of Rotational Motion

10.1: Torque

10.2: Torque and Angular Acceleration for a Rigid Body

10.3: Rigid-Body Rotation About a Moving Axis

10.4: Work and Power in Rotational Motion

10.5: Angular Momentum

10.6: Conservation of Angular Momentum

Chapter 13: Gravitation

13.1: Newton's Law of Gravitation

13.2: Weight

13.3: Gravitational Potential Energy

13.4: The Motion of Satellites

13.5: Kepler's Laws and the Motion of Planets

Chapter 14: Periodic Motion

14.1: Describing Oscillation

14.2: Simple Harmonic Motion

14.3: Energy in Simple Harmonic Motion

14.4: Applications of Simple Harmonic Motion

14.5: The Simple Pendulum

14.6: The Physical Pendulum

14.7: Damped Oscillations

14.8: Forced Oscillations and Resonance

Chapter 15: Mechanical Waves

15.1: Types of Mechanical Waves

15.2: Periodic Waves

15.3: Mathematical Description of a Wave

- 15.4: Speed of a Transverse Wave
- 15.5: Energy in Wave Motion
- 15.6: Wave Interference, Boundary Conditions, and Superposition
- 15.7: Standing Waves on a String
- 15.8: Normal Modes of a String

Chapter 16: Sound and Hearing

- 16.1: Sound Waves
- 16.2: Speed of Sound Waves
- 16.3: Sound Intensity
- 16.4: Standing Sound Waves and Normal Modes
- 16.5: Resonance and Sound
- 16.6: Interference of Waves
- 16.7: Beats
- 16.8: The Doppler Effect

Chapter 35: Interference

- 35.1: Interference and Coherent Sources
- 32.1-32.3: Electromagnetic Waves
- 35.2: Two-Source Interference of Light
- 35.3: Intensity in Interference Patterns

Chapter 36: Diffraction

- 36.2: Diffraction from a Single Slit
- 36.3: Intensity in the Single-Slit Pattern

Chapter 33: The Nature and Propagation of Light

- 33.1: The Nature of Light
- 33.2: Reflection and Refraction
- 33.3: Total Internal Reflection

Chapter 34: Geometric Optics

- 34.1: Reflection and Refraction at a Plane Surface
- 34.2: Reflection at a Spherical Surface
- 34.3: Refraction at a Spherical Surface
- 34.4: Thin Lenses

Chapter 38: Photons: Light Waves Behaving as Particles

- 38.1: Light Absorbed as Photons: The Photoelectric Effect
- 38.2: Light Emitted as Photons: X-Ray Production
- 38.3: Light Scattered as Photons: Compton Scattering and Pair Production

Chapter 39: Particles Behaving as Waves

- 39.1: Electron Waves