UNIVERSITY OF THE FRASER VALLEY

ORIGINAL COURSE IMPLEMENTATION DATE: December 1996
REVISED COURSE IMPLEMENTATION DATE: January 2025
COURSE TO BE REVIEWED (six years after UEC approval)**:** August 2030
Course outline form version: 26/01/2024

OFFICIAL UNDERGRADUATE COURSE OUTLINE FORM

Note: The University reserves the right to amend course outlines as needed without notice.

Course Code and Number: PHYS 093	**Number of Credits:** 3 Course credit policy (105)
Course Full Title: Provincial-Level Physics **Course Short Title:** Provincial-Level Physics	
Faculty: Faculty of Education, Community, & Human Dev.	**Department:** Upgrading and University Preparation

Calendar Description:

This university preparatory course, which is equivalent to B.C. Physics 12, covers mechanics, electrostatics and electromagnetism.

Prerequisites (or NONE):	(One of Applications of Mathematics 11, Principles of Mathematics 11, Pre-Calculus 11, Foundations of Mathematics 11, MATH 084, or MATH 085) and (one of Physics 11, PHYS 083, or PHYS 100).
Corequisites (if applicable, or NONE):	**NONE**
Pre/corequisites (if applicable, or NONE):	**NONE**

Antirequisite Courses *(Cannot be taken for additional credit.)*

Former course code/number: **N/A**

Cross-listed with: **N/A**

Equivalent course(s): **N/A**

Typical Structure of Instructional Hours

Lecture/seminar	60
Tutorials/workshops	9
Supervised laboratory hours (science lab)	21
Total hours	**90**

Scheduled Laboratory Hours

Labs to be scheduled independent of lecture hours: ☒ No ☐ Yes

Course Details

Special Topics course: **No**

(If yes, the course will be offered under different letter designations representing different topics.)

Directed Study course: **No**

(See policy 207 for more information.)

Grading System: **Letter grades**

Delivery Mode: **May be offered in multiple delivery modes**

Expected frequency: **Annually**

Maximum enrolment (for information only)**: 24**

Prior Learning Assessment and Recognition (PLAR)

PLAR is available for this course.

Transfer Credit *(See **bctransferguide.ca**.)*

Transfer credit already exists: **No**

Submit outline for (re)articulation: **No**

(If yes, fill in transfer credit form.)

Department approval	**Date of meeting:**	January 19, 2024
Faculty Council approval	**Date of meeting:**	April 26, 2024
Undergraduate Education Committee (UEC) approval	**Date of meeting:**	August 29, 2024

Learning Outcomes *(These should contribute to students' ability to meet program outcomes and thus Institutional Learning Outcomes.)*

After completion of PHYS 093, students will meet the outcomes described for ABE Provincial Level (Grade 12) Physics located in the 2023-24 ABE Articulation Handbook. https://www.bctransferguide.ca/transfer-options/adult-basic-education/past-abe-guides/

A. The core topics are: Measurement and Mathematics Skills
- Review problems involving SI units, signification figures and uncertainties in measurement
- Resolve, add and subtract vectors using trigonometry

B. Kinematics in Two Dimensions
- Use the language and concepts of kinematics to describe motion in two dimensions
- Resolve, add and subtract vectors
- Analyze and solve kinematical problems in two dimensions

C. Dynamics in Two Dimensions
- Use the language and concepts of dynamics to describe forces, energy and momentum
- Analyze and solve problems involving dynamics in two dimensions using free body diagrams
  - Newton's Law's
  - Torque, translational and rotational equilibrium
  - Momentum, energy conservation
  - Uniform circular motion

D. Electrostatics
- Use the language and concepts of physics to describe electrostatic phenomena.
- Analyze and solve electrostatic force and electric field problems in two dimensions.
- Analyze and solve electric potential and electric potential energy problems.

E. Electromagnetism
- Use the language and concepts of physics to describe electromagnetic phenomena.
- Analyze and solve problems involving magnetic forces and magnetic fields in two dimensions
- Analyze and solve problems involving electromagnetic induction – Faraday's Law and Lenz's law
- Describe devices that operate using electromagnetic induction.

The following options may be useful to students going on to further physics courses:
- AC Circuits
- Astronomy
- Electronics
- Fluids
- Kirchhoff's Laws
- Nuclear Physics
- Quantum Physics
- Relativity

Laboratories:
There will be one laboratory from each topic and a **minimum** of seven laboratories. Successful students will be able to:
- Collect data through observation:
  - Record a measurement to the appropriate level of precision.
  - Recognize that all measured values have an uncertainty.
- Construct graphs:
  - Choose appropriate scales.
  - Determine line of best fit.
  - Label correctly.
- Draw conclusions from observations and data:
  - Identify and discuss sources of error.
  - Calculate and interpret the slope of a line.
  - Relate conclusion to objectives.
- Calculate experimental error:
  - Determine % error and % difference where appropriate
- Complete formal lab reports.
- Participate in Experimental Design.

Recommended Evaluation Methods and Weighting *(Evaluation should align to learning outcomes.)*

Final exam:	30%	Assignments:	10%	Lab work:	20%
Midterm:	20%	Quizzes/tests:	20%		

Details:

NOTE: The following sections may vary by instructor. Please see course syllabus available from the instructor.

Typical Instructional Methods *(Guest lecturers, presentations, online instruction, field trips, etc.)*

The course will be presented using a variety of techniques: classroom lectures; laboratory experiments; activities; films; and demonstrations.
Close coordination will be maintained between the theoretical and laboratory work.
Weekly assignments will be used to evaluate the rate of learning and the depth of the student's comprehension.
The labs will be integrated into the class schedule.
Regular class sessions will also consist of lab related demonstrations and activities.
The experiments will be used to interact with the students on a more personal level. This time can be used to give individual help.

Texts and Resource Materials *(Include online resources and Indigenous knowledge sources. Open Educational Resources (OER) should be included whenever possible. If more space is required, use the Supplemental Texts and Resource Materials form.)*

	Type	Author or description	Title and publication/access details	Year
1.	Textbook	Wilson, Buffa, Lou	College Physics, Pearson	2009
2.	Textbook	Urone, Hinrichs	College Physics, Openstax	2016
3.				
4.				
5.				

Required Additional Supplies and Materials *(Software, hardware, tools, specialized clothing, etc.)*

Scientific calculator

Course Content and Topics

- Kinematics in two dimensions
- Dynamics in two dimensions
- Electrostatics
- Electromagnetism
- Measurement and mathematical skills