



PHYS-090 – Physics – Provincial Level

College Preparation and Upgrading

Effective Term & Year: Fall 2022

Course Outline Review Date: 2027-03-01

Program Area: Upgrading for Academic and Career Entry

Description:

In this course, students extend a conceptual understanding of one-dimensional motion to encompass two-dimensional motion. Using vectors and sophisticated laboratory equipment, students model behaviours in two dimensions. Skills and knowledge are then applied to electrostatics and electromagnetism. Students continue to develop scientific laboratory skills such as data collection, graphing information, drawing conclusions from observations and writing formal lab reports.

Program Information:

This course prepares student for entry into University Studies or Career/Technology programs.

Delivery Methods: On-campus (Face-to-Face)

Credit Type: ABE Credits

Credits: 3

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	67.5
Seminar/Tutorials	
Laboratory/Studio	30
Practicum/Field Experience	

Co-op/Work Experience	
Other	15
Total	112.5

Course Requisites:

- Complete 1 of the following
 - Completed the following:
 - **PHYS080** – Physics – Advanced Level
 - Completed at least 1 of the following:
 - **MATH080** – Mathematics – Advanced Level
 - **PREC 11** – Pre-Calculus 11
 - Completed or concurrently enrolled in:
 - **MATH090** – Mathematics – Provincial Level

Flexible Assessment: Yes

In some cases students may be able to apply for recognition of prior learning outside the classroom. This flexible assessment process provides equivalent course credit. It is a rigorous process that may include external evaluation, worksite assessment, demonstration, standardized test, self-assessment, interview, products/portfolio, and challenge exam, or other measures as appropriate. Tuition fees apply. Contact an education advisor for more information.

Course Transfer Credit:

For information about receiving transfer credit for courses taken at either British Columbia or Alberta institutions, please see <https://www.bctransferguide.ca/> or <https://transferalberta.alberta.ca> . For more transfer credit information, please visit <https://www.cotr.bc.ca/Transfer>

All requests for course transfer credit from institutions in British Columbia or elsewhere should go to the College of the Rockies Enrolment Services office.

Textbook Resources:

Textbook selection varies by instructor and may change from year to year. At the Course Outline Effective Date the following textbooks were in use:

Wilson, Buffa, Lou. *College Physics*, 7th ed. Pearson Prentice Hall. ISBN 0-13-149579-8

Please see the instructor's syllabus or check COTR's online text calculator <https://textbook.cotr.bc.ca/> for a complete list of the currently required textbooks.

Learning Outcomes:

Upon successful completion of this course, students will be able to demonstrate competency in Provincial Level Physics outcomes as stated in the 2022-2023 ABE-BC Articulation Handbook:

A) Measurement & Mathematical Skills

- Review problems involving SI units, significant 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
- Analyze and solve kinematics in two dimensions

C) Dynamics in Two Dimensions

- Use the language and concepts of dynamics to describe forces, energy and momentum
- Analyze and solve dynamics in two dimensions using free body diagrams
- Newton's Laws
- 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 forces and electric fields in two dimensions
- Analyze and solve electric potential and electric potential energy

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; includes Faraday's Law and Lenz's law
- Describe devices that operate using electromagnetic induction

Laboratories:

Successful completion of one laboratory from each core topic and a minimum of seven laboratories are required. Laboratory skills must include:

Collecting data through observation

- Record a measurement to the appropriate level of precision
- Recognize that all measured values have an uncertainty

Constructing graphs

- Choose appropriate scales
- Determine line of best fit
- Label correctly

Drawing conclusions from observations and data

- Identify and discuss sources of error
- Calculate and interpret the slope of a line
- Relate conclusion to objectives

Calculating experimental error

- Determine percent error and percent difference where appropriate

Writing formal laboratory reports

Participate in experimental design

Course Topics:

- Measurement and Problem Solving
- Description of Motion
- Motion in Two Dimensions
- Forces and Motion
- Work and Energy
- Linear Momentum and Collisions
- Circular Motion
- Electric Charge, Forces and Fields
- Electric Potential Energy and the Electric Potential
- Magnetism and Electromagnetism

See instructor's syllabus for the detailed outline of weekly readings, activities and assignments.

The outcomes of this course meet and are consistent with the outcomes prescribed for Computer Studies: Fundamental Level in the Adult Basic Education in British Columbia

Colleges – An Articulation Handbook –

<https://www.bctransferguide.ca/wp-content/uploads/2022/08/abeguide2223.pdf>

Evaluation and Assessments

Assessment Type: On-Campus (face-to-face)

Assessment Type	% of Total Grade
Assignments and Quizzes	15%
Lab Investigations	15%
Midterms	30%
Final Exam	40%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=95	94-90	89-85	84-80	79-75	74-70	69-65	64-60	59-55	54-50	<50

Pass requirements: None

Evaluation Notes: A grade of “D” grants credit, but may not be sufficient as a prerequisite for sequential courses.

Exam Attendance:

Students must attend all scheduled exams at the appointed time and place. Instructors may approve an alternate exam to accommodate an illness or personal crisis. Department heads will consider other written requests. Any student who misses a scheduled exam without prior approval will receive a “0” on the exam.

Academic Policies:

College of the Rockies policies related to courses can be found at <https://cotr.bc.ca/about-us/college-policies/> and include the following:

- Policy 2.4.3 Students with Documented Disabilities
- Policy 2.4.4 Student Conduct (plagiarism, other cheating, behavioral misconduct)
- Policy 2.5.8 Academic Performance
- Policy 2.5.3 Grade Appeal
- Policy 2.4.9 Student Concerns Re Faculty

Course Changes:

The College of the Rockies updates course outlines regularly to meet changing educational, employment and marketing needs. The instructor will notify students in writing of any updates to this outline during the semester. The instructor reserves the right to revise, add or delete material while meeting the learning outcomes of this course outline.