

Physics, Provincial Level – PHYS 090

Upgrading for Academic and Career Entry

Course Outline

COURSE IMPLEMENTATION DATE:	Pre 1998
OUTLINE EFFECTIVE DATE:	September 2022
COURSE OUTLINE REVIEW DATE:	March 2027

GENERAL COURSE 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 electro statics 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 students for entry into University Studies or Career/Technology programs.

Delivery: This course is delivered face-to-face.

ABE Credits: 3

Hours for this course: 112.5 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	67.5
Seminars / Tutorials	
Laboratory / Studio Hours	30
Practicum / Field Experience Hours	
Other Contact Hours	15
Total	112.5

Practicum Hours (if applicable):

Type of Practicum	Duration
On-the-job Experience	N/A
Formal Work Experience	N/A
Other	N/A
Total	

Other Contact Hours:

- Guided Practice

Course Outline Author or Contact:

Deb Heal, BEd

Signature

APPROVAL SIGNATURES:

Department Head

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Dean of Trades and Technology

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Department Head Signature

Dean Signature

EDCO

Valid from: September 2022 – March 2027

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:**Prerequisites:** PHYS 080 or Physics 11, and MATH 080 or Pre-Calculus 11 or Principles 11.**Corequisites:** Math 090 must be taken either prior to or concurrently.**Flexible Assessment (FA):**

Credit can be awarded for this course through FA

☒ Yes☐ No

Learners may request formal recognition for flexible assessment at the College of the Rockies through one or more of the following processes: External Evaluation, Worksite Assessment, Demonstration, Standardized Test, Self-assessment, Interview, Products/Portfolio or Challenge Exam. Contact an Education Advisor for more information.

Transfer Credit: For transfer information within British Columbia, Alberta and other institutions, please visit <http://www.cotr.bc.ca/Transfer>.

Students should also contact an academic advisor at the institution where they want transfer credit.

Prior Course Number: N/A

Textbooks and Required 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

<http://go.cotr.bc.ca/tuition/tCalc.asp> 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
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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.

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Assignments and Quizzes	15%
Lab Investigations	15%
Midterms	30%
Final Exam	<u>40%</u>
Total	100%

Please see the instructor's syllabus for specific classroom policies related to this course, such as details of evaluation, penalties for late assignments and use of electronic aids.

EXAM POLICY:

Students must attend all required scheduled exams that make up a final grade at the appointed time and place.

Individual instructors may accommodate for illness or personal crisis. Additional accommodation will not be made unless a written request is sent to and approved by the appropriate Department Head prior to the scheduled exam.

Any student who misses a scheduled exam without approval will be given a grade of "0" for the exam.

COURSE GRADE:

Course grades are assigned as follows:

Grade	A+	A	A-	B+	B	B-	C+	C	C-	D	F
Mark (Percent)	≥ 95	94-90	89-85	84-80	79-75	74-70	69-65	64-60	59-55	54-50	< 50

A grade of "D" grants credit, but may not be sufficient as a prerequisite for sequential courses.

ACADEMIC POLICIES:

See www.cotr.bc.ca/policies for general college policies related to course activities, including grade appeals, cheating and plagiarism.

COURSE CHANGES:

Information contained in course outlines is correct at the time of publication. Content of the courses is revised on an ongoing basis to ensure relevance to changing educational, employment and marketing needs. The instructor will endeavour to provide notice of changes to students as soon as possible. The instructor reserves the right to add or delete material from courses.