



Physics, Advanced Level – PHYS 080
Access Education/Upgrading for Academic and Career Entry

Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998
OUTLINE EFFECTIVE DATE: September 2018
COURSE OUTLINE REVIEW DATE: March 2023

GENERAL COURSE DESCRIPTION:

This course introduces students to physical laws governing motion, heat, electricity, waves and optics. Using verbal descriptions, geometry, algebra, graphs and vectors, students model the physical world and lend structure to common sense ideas about how the physical world behaves. Sophisticated data equipment in the physics laboratory gives students quick and easy access to data allowing them to develop models describing their environment.

Program Information: This course is a prerequisite for PHYS 090 and may be used as preparation for entry into career programs.

Delivery: This course is delivered face to face and in a directed studies format.

Hours for this course: 112.5 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	60
Seminars / Tutorials	
Laboratory / Studio Hours	30
Practicum / Field Experience Hours	
Other Contact Hours	22.5
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:

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Signature

APPROVAL SIGNATURES:

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Department Head Signature

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EDCO

Valid from: September 2018 – March 2023

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: MATH 080 or Pre-Calculus 11 or Principles 11 is a required course, either taken prior to PHYS 080 or concurrently.

Corequisites:

Flexible Assessment (FA):

Credit can be awarded for this course through FA Yes No

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.

No specific textbook is currently required for this course.

Reference Website: www.physicsclassroom.com

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 the successful completion of this course, students will be able to demonstrate competency in ABE Advanced Level Physics topics as stated in the 2018 - 2019 Articulation Handbook:

- A) Measurement
 - Solve problems involving SI units
 - Maintain the correct number of significant numbers in calculations
 - Use uncertainties in measurement
 - Define vector and scalar quantities

- B) Kinematics
 - Use the language and concepts of kinematics to describe motion
 - Analyze and solve kinematics in one dimension
 - Construct and interpret displacement versus time curves
 - Construct and interpret velocity versus time graphs
 - Solve problems involving uniform acceleration

- C) Dynamics
 - Use the language and concepts of dynamics to describe forces and energy
 - Analyze and solve dynamics in one dimension using free body diagrams
 - Apply Newton's laws of motion in one dimension
 - Solve problems involving
 - Friction forces
 - Gravity forces including Newton's Law of Universal Gravitation
 - Analyze and solve problems in kinetic and potential energy
 - Analyze and solve problems in energy conservation
 - Solve problems involving work and power
 - Solve problems involving impulse and conservation of momentum in one dimension

- D) Electricity
 - Use the language and concepts of electricity to describe electrical phenomena
 - Analyze and solve problems using Coulomb's law
 - Analyze and solve problems involving Ohm's law
 - Define and distinguish between electric potential difference, resistance and current
 - Solve simple DC resistance problems involving series, parallel and combination circuits

E) Heat

- Use the language and concepts of thermodynamics to describe the transfer of heat energy
- Define and distinguish between temperature, heat energy and specific heat capacity
- Analyze and solve problems in heat energy
- Demonstrate an understanding of the different mechanisms of heat transfer

F) Waves and Optics

- Use the language and concepts of physics to describe wave phenomena including
- Define and distinguish between amplitude, wavelength, frequency, wave speed and period
- Analyze and solve problems involving wave phenomena – refraction, reflection, total internal reflection
- Describe various wave phenomena and the conditions which produce them
- Solve problems involving lens equation and mirror equation
- Construct ray diagrams for mirrors and lenses

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
- Completing formal lab reports

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

COURSE TOPICS:

- Measurement - Science, Math and Measurement
- Kinematics - Linear Motion and Vectors

- Dynamics
 - Newton's Laws
 - Momentum, Energy and Conservation
 - Circular Motion and Gravity
- Electricity
- Heat
- Waves and Optics

EVALUATION AND ASSESSMENT (Face-to-Face and Directed Studies Delivery):

Assignments	% Of Total Grade
Assignments, Lab Activities, Quizzes	35%
Midterms	30%
Final Exam	<u>35%</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.