



Introduction to Physics I – PHYS 103

University Studies Program

Course Outline

COURSE IMPLEMENTATION DATE: Pre 1998
OUTLINE EFFECTIVE DATE: September 2020
COURSE OUTLINE REVIEW DATE: March 2025

GENERAL COURSE DESCRIPTION:

This course introduces the student to how calculus is used to build physical theory and to solve problems in kinematics, dynamics, momentum, and centre of mass calculations. In addition, the student is introduced to several conservation laws, in particular conservation of mechanical energy and linear and angular momentum.

Program Information: This course is required for majors in Math, Physics, Engineering and Chemistry. It is usable for Associate of Science and Arts.

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

COTR Credits: 3

Hours for this course: 90 hours

Typical Structure of Instructional Hours:

Instructional Activity	Duration
Lecture Hours	45
Seminars / Tutorials	
Laboratory / Studio Hours	45
Practicum / Field Experience Hours	
Other Contact Hours	
Total	90

Practicum Hours (if applicable):

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

Course Outline Author or Contact:

Benjamin Tippett, BSc in Physics,
MSC in Physics, PhD in Mathematics

Signature

APPROVAL SIGNATURES:

Department Head
Erin Aasland Hall
E-mail: aaslandhall@cotr.bc.ca

Dean of Business and University Studies
Darrell Bethune
E-mail: bethune@cotr.bc.ca

Department Head Signature

Dean Signature

EDCO

Valid from: September 2020 – March 2025

Education Council Approval Date

COURSE PREREQUISITES AND TRANSFER CREDIT:

Prerequisites: Either PHYS 090, Physics 12, or equivalent. MATH 103 is a required course, either taken prior or concurrently.

Corequisites: None

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, 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:

Halliday, Resnick, and Walker, 9th edition, *Fundamentals of Physics*, Wiley.

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

- use calculus to solve a variety of physical problems;
- understand what vectors are and use them to solve problems in kinematics, dynamics, work, torque, angular momentum, etc.;
- understand Newton's three laws and use them to derive appropriate differential equations, construct free body diagrams, and to solve the equations of motion;
- use energy to solve a variety of problems;
- Understand the concepts involved in rotational motion and use them to solve problems involving torque and rolling; and
- use the concept of static equilibrium to construct free body diagrams and solve problems where forces and torques balance.

This course should help students

- use written and oral communication skills effectively, employing methods appropriate to message and context;
 - think clearly and critically, fusing experience, knowledge and reasoning into considered judgment; and
 - identify, interpret, and solve problems, effectively implementing and evaluating proposed strategies.
-

COURSE TOPICS:

- Measurement.
- Vectors.
- Kinematics in one-, two-, and three-dimensions.
- Dynamics: Newton's laws, friction, uniform circular motion.
- Potential and kinetic energy, work, conservation of mechanical energy.
- Centre of mass, linear momentum, conservation of momentum.
- Angular momentum, torque, conservation of angular momentum.
- Static equilibrium.
- Newton's Law of Gravity.

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

EVALUATION AND ASSESSMENT:

Assignments	% Of Total Grade
Assignments	20%
Laboratory	20%
Midterms	30%
Final Exam	<u>30%</u>
Total	100%

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

Note: Satisfactory completion of Laboratory is necessary to receive a grade in this course.

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)	≥ 90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	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.