COLLEGE OF
THE ROCKIES

PHYS-103 – Introduction to Physics 1

University Arts and Science

Effective Term & Year: Fall 2022
Course Outline Review Date: 2025-03-01

Program Area: Math and Sciences

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

Credit Type: College of the Rockies Credits

Credits: 3

Course type/s: Lab Sciences, Sciences

Instructional Activity and Hours:

Activity	Hours
Classroom, Directed Studies or Online Instruction	45
Seminar/Tutorials	
Laboratory/Studio	45
Practicum/Field Experience	
Co-op/Work Experience	

Other	
Total	90

Course Requisites:

- Complete all of the following
  - Completed the following:
    - PHYS12 – Physics 12
    - PHYS090 – Physics – Provincial Level (3)
  - Completed or concurrently enrolled in:
    - MATH103 – Differential Calculus (3)

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 Columba 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:

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

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 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 Assessments

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

Assessment Type	% of Total Grade
Assignments	20%
Laboratory	20%
Midterms	30%
Final Exam	30%
Total	100%

Grade Scheme

A+	A	A-	B+	B	B-	C+	C	C-	D	F
>=90	89-85	84-80	79-76	75-72	71-68	67-64	63-60	59-55	54-50	<50

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

Evaluation Notes Comments:

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.

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.