COURSE SYLLABUS

COURSE TITLE: PHYS-140: Physics for Scientists and Engineers 1

CLASS SECTION: 002AB

TERM: F2024

COURSE CREDITS: 4

DELIVERY METHOD(S): In person

Camosun College campuses are located on the traditional territories of the Lək̓ʷəŋən and W̱SÁNEĆ peoples. We acknowledge their welcome and graciousness to the students who seek knowledge here.
Learn more about Camosun's Territorial Acknowledgement.

INSTRUCTOR DETAILS

NAME: Jean-Marc (JM) Miszaniec

EMAIL: MiszaniecJ@camosun.bc.ca, Nelson@camosun.ca

OFFICE: F346C

HOURS: By Appointment / Drop-in

As your course instructor, I endeavour to provide an inclusive learning environment. However, if you experience barriers to learning in this course, do not hesitate to discuss them with me. Camosun College is committed to identifying and removing institutional and social barriers that prevent access and impede success.

CALENDAR DESCRIPTION

This calculus-based course is intended for students in Science or Engineering. Students will study the mechanics of particles analyzing problems involving forces and equations of motion in multiple dimensions, conservation laws, rotational kinematics and dynamics. Students will further investigate electric fields and electric potential; DC circuits, and magnetic fields. Students will explore how these fundamental principles apply in laboratory settings.

PREREQUISITE(S):

One of:

- C in Physics 12
- C in Camosun Alternative

CO-REQUISITE(S):

All of:

- C in MATH 100

EXCLUSION(S):

Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

Learning Outcomes

Upon completion of the course the student will be able to:

1. Apply techniques of vector algebra to solve problems where vectors sum to zero or calculate resultant vectors.

a. Perform coordinate system conversions.

b. Demonstrate operations of vector addition and subtraction using graphical, vector component and unit vector techniques.

c. Calculate and interpret scalar product and vector products.

2. Solve problems involving particle kinematics and dynamics for translational motion with non-constant force.

a. Apply kinematic equations to analyze motion of objects subject to constant acceleration.

b. Use calculus to analyze motion of objects with non-constant acceleration.

c. Use vector components to analyze motion in two and three dimensions.

d. Solve problems for objects undergoing uniform and non-uniform circular motion.

e. State and apply Newton's Laws to analyze systems subject to concurrent forces including friction, inclines and connected objects.

3. Analyze the rotational motion of rigid bodies.

a. Calculate the center-of-mass and moment-of-inertia for uniform objects including the parallel-axis theorem.

b. Perform calculations and answer conceptual questions using torques. Solve equilibrium problems for non-concurrent forces.

c. Define the rotational kinematic quantities; transform between linear and rotational quantities.

d. Use the rotational form of Newton's 2nd Law to solve dynamics problems.

e. Apply translational and rotational conditions of mechanical equilibrium.

4. Use work-energy theorem and other conservation laws to solve applied problems.

a. Solve problems involving work by constant and non-constant forces in two and three dimensions.

b. Calculate work, energy and power for rotational systems.

c. Perform calculations utilizing the conservation of momentum of isolated systems for elastic and inelastic collisions.

d. Perform calculations utilizing the conservation of angular momentum for rotating systems.

5. Apply concepts of dynamics, work and energy to analyze charged particles in electric and magnetic fields.

a. Calculate electric fields, forces, potential and potential energy for point charges and simple charge distributions.

b. Perform calculations for charged particles moving in uniform electric and magnetic fields; describe their motion and practical applications.

c. Solve problems for multi-branch direct current circuits using Ohm's Laws and Kirchhoff's Rules.

6. Examine the validity of key physical principles through the use of practical experimental techniques.

a. Assemble experimental apparatus using written instructions.

b. Observe and record data including sources of error and estimate the range of uncertainty in results.

c. Interpret meaning of experimental results in the context of the experimental objectives.
d. Write scientific reports in correct format.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

Required materials:

- Scientific calculator
- Ruler
- Access to a computer with Microsoft Excel. (Students can access Excel through the Microsoft Office Suite available free to students here: https://legacy.camosun.ca/services/its/other-services.html.)
- Physics 140 Lab Manual

Optional material:

- Physics by Giancoli, 7th Edition (Copies available in Lansdowne Campus Library and the Bookstore)

COURSE SCHEDULE, TOPICS, AND ASSOCIATED PREPARATION / ACTIVITY / EVALUATION

The following schedule and course components are subject to change with reasonable advance notice, as deemed appropriate by the instructor.

Students registered with the Centre for Accessible Learning (CAL) who complete quizzes, tests, and exams with academic accommodations have booking procedures and deadlines with CAL where advanced noticed is required. Deadlines scan be reviewed on the CAL exams page. http://camosun.ca/services/accessible-learning/exams.html

EVALUATION OF LEARNING

	WEIGHTING
Homework	10%
Labs	25%
Tests (4)	25%
Capstone Lab Report	10%
Final	30%
TOTAL	100%

If you have a concern about a grade you have received for an evaluation, please come and see me as soon as possible. Refer to the Grade Review and Appeals policy for more information. http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf

COURSE GUIDELINES & EXPECTATIONS

Course content will be posted daily on d2L.

- Course content, announcements, and important class information will be posted on d2L. Students must check d2L regularly.

Homework

- Homework is due in the first 30 minutes of the lab period
- Homework is marked for completion. Criteria for completion must be met.
- Late homework is not accepted.

Tests

- Tests are to be completed during lab periods. Students will be given 1.5 hours to complete the tests.
- Students are allowed calculators on tests
- Formula sheets are provided by instructor
- Tests will be composed of 2 easy questions (2 pts), 3 medium questions (3 points) 2 hard questions (4 points)

Labs

- Lab reports are due latest 11:59 PM one week after experiment is performed. Any changes in due dates or timelines will be posted on the D2L calendar.
- Labs will be submitted as a group fulfilling the specified requirements.
- Groups will switch every two lab sessions.
- Labs submitted one day late will obtain a maximum score of 60%. Additional late days decreases the max score by 10 percentage points.

Capstone Lab Report

- The capstone lab report is an individual effort
- The capstone report entails a formal lab report including all necessary and required sections of a formal lab.

PHYSICS DEPARTMENT GUIDELINES REGARDING TESTING AND GRADING:

- As stated in the current college calendar, "students are expected to write tests and final exams at the scheduled time and place." Exceptions will only be considered due to emergency circumstances as outlined in the calendar. Holidays or scheduled flights are not considered to be emergencies.

- Students must write tests, midterm tests, etc., on the date and time assigned by the instructor. Missed exams normally receive a zero grade. Instructors are not required to provide make-up tests. At their discretion, instructors may waive a test in exceptional circumstances such as medical issues or a documented illness.

Missed Labs Guidelines:

- Laboratory activities are in-person activities; attendance and participation are required. Reports will
- not be accepted from students who did not attend the lab period.
- If you arrive more than 30 minutes late to the lab, you may be recorded as absent.
- Students who will miss a laboratory session have an obligation to seek out concessions directly from their instructor in a timely manner, BEFORE the lab period occurs. In the event of unforeseen

  circumstances, lab instructors must be notified within 24 hours of the missed lab period, or

  concessions will not be available.

- If you miss up to three (3) laboratory sessions, you are still eligible to meet the Learning Outcomes for the course, though missed labs may receive a zero grade.
- If you miss a total of four (4) or more labs for any reason including, but not limited to: life circumstances, illness, family or pet obligations, planned vacations, milestone family events, work

  commitments, competitive athletic event., you will be unable to meet the learning outcomes for the

  class and will receive a failing grade (F) in the entire course, regardless of marks received on graded

  lab and lecture components. Exceptions will only be considered through an academic concession

  granted by the instructor or Dean/Associate Dean.

- Please note that if you are suffering from a serious medical illness that prevents you from participating in this course, Camosun College has a Compassionate Medical Withdrawal Policy (https://camosun.ca/services/forms#medical)

SCHOOL OR DEPARTMENTAL INFORMATION

- **Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.**
- At the discretion of the instructor, a student who is repeating this Physics course with a laboratory grade of 70% or higher may apply for lab exemption

STUDENT RESPONSIBILITY

Enrolment at Camosun assumes that the student will become a responsible member of the College community. As such, each student will display a positive work ethic, assist in the preservation of College property, and assume responsibility for their education by researching academic requirements and policies; demonstrating courtesy and respect toward others; and respecting expectations concerning attendance, assignments, deadlines, and appointments.

SUPPORTS AND SERVICES FOR STUDENTS

Camosun College offers a number of services to help you succeed in and out of the classroom. For a detailed overview of the supports and services visit http://camosun.ca/students/.

Academic Advising	http://camosun.ca/advising
Accessible Learning	http://camosun.ca/accessible-learning
Counselling	http://camosun.ca/counselling

Career Services	http://camosun.ca/coop
Financial Aid and Awards	http://camosun.ca/financialaid
Help Centres (Math/English/Science)	http://camosun.ca/help-centres
Indigenous Student Support	http://camosun.ca/indigenous
International Student Support	http://camosun.ca/international/
Learning Skills	http://camosun.ca/learningskills
Library	http://camosun.ca/services/library/
Office of Student Support	http://camosun.ca/oss
Ombudsperson	http://camosun.ca/ombuds
Registration	http://camosun.ca/registration
Technology Support	http://camosun.ca/its
Writing Centre	http://camosun.ca/writing-centre

If you have a mental health concern, please contact Counselling to arrange an appointment as soon as possible. Counselling sessions are available at both campuses during business hours. If you need urgent support after-hours, please contact the Vancouver Island Crisis Line at 1-888-494-3888 or call 911.

COLLEGE-WIDE POLICIES, PROCEDURES, REQUIREMENTS, AND STANDARDS

Academic Accommodations for Students with Disabilities

The College is committed to providing appropriate and reasonable academic accommodations to students with disabilities (i.e. physical, depression, learning, etc). If you have a disability, the Centre for Accessible Learning (CAL) can help you document your needs, and where disability-related barriers to access in your courses exist, create an accommodation plan. By making a plan through CAL, you can ensure you have the appropriate academic accommodations you need without disclosing your diagnosis or condition to course instructors. Please visit the CAL website for contacts and to learn how to get started: http://camosun.ca/services/accessible-learning/

Academic Integrity

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.13.pdf for policy regarding academic expectations and details for addressing and resolving matters of academic misconduct.

Academic Progress

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.1.pdf for further details on how Camosun College monitors students' academic progress and what steps can be taken if a student is at risk of not meeting the College's academic progress standards.

Course Withdrawals Policy

Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.2.pdf for further details about course withdrawals. For deadline for fees, course drop dates, and tuition refund, please visit http://camosun.ca/learn/fees/#deadlines.

Grading Policy

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf for further details about grading.

Grade Review and Appeals

Please visit http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf for policy relating to requests for review and appeal of grades.

Mandatory Attendance for First Class Meeting of Each Course

Camosun College requires mandatory attendance for the first class meeting of each course. If you do not attend, and do not provide your instructor with a reasonable reason in advance, you will be removed from the course and the space offered to the next waitlisted student. For more information, please see the "Attendance" section under "Registration Policies and Procedures" (http://camosun.ca/learn/calendar/current/procedures.html) and the Grading Policy at http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.5.pdf.

Medical / Compassionate Withdrawals

Students who are incapacitated and unable to complete or succeed in their studies by virtue of serious and demonstrated exceptional circumstances may be eligible for a medical/compassionate withdrawal. Please visit http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.8.pdf to learn more about the process involved in a medical/compassionate withdrawal.

Sexual Violence and Misconduct

Camosun is committed to creating a campus culture of safety, respect, and consent. Camosun's Office of Student Support is responsible for offering support to students impacted by sexual violence. Regardless of when or where the sexual violence or misconduct occurred, students can access support at Camosun. The Office of Student Support will make sure students have a safe and private place to talk and will help them understand what supports are available and their options for next steps. The Office of Student Support respects a student's right to choose what is right for them. For more information see Camosun's Sexualized Violence and Misconduct Policy: http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.9.pdf and camosun.ca/sexual-violence. To contact the Office of Student Support: oss@camosun.ca or by phone: 250-370-3046 or 250-3703841

Student Misconduct (Non-Academic)

Camosun College is committed to building the academic competency of all students, seeks to empower students to become agents of their own learning, and promotes academic belonging for everyone. Camosun also expects that all students to conduct themselves in a manner that contributes to a positive, supportive, and safe learning environment. Please review Camosun College's Student Misconduct Policy at

http://camosun.ca/about/policies/education-academic/e-2-student-services-and-support/e-2.5.pdf to understand the College's expectations of academic integrity and student behavioural conduct.

Changes to this syllabus: Every effort has been made to ensure that information in this syllabus is accurate at the time of publication. The College reserves the right to change courses if it becomes necessary so that course content remains relevant. In such cases, the instructor will give the students clear and timely notice of the changes.