COURSE SYLLABUS

COURSE TITLE: PHYS-160: Biomechanics of Sport

CLASS SECTION: X01A X01B

TERM: 2025W

COURSE CREDITS: 3

DELIVERY METHOD(S): In-person, face to face, in Lecture and Laboratory

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: Ed Nelson

EMAIL: nelson@camosun.ca

OFFICE: TEC 218

HOURS: M 1:00 – 2:00pm; TF 1:30 – 2:30 pm (drop-in); Th 2:30 – 3:20; make an appointment by email; drop by if office door is open anytime; send a text to 250 884 6266 for short questions or in case of emergency

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 course is an introduction to Newtonian Mechanics in the context of human movement and the optimization of motor skills. The sequence of topics includes: terminology of biomechanics, Newton's Laws of Motion, forces, linear kinematics, work and energy, power, momentum, rotational kinematics, hydrostatics, and biomechanical analysis of sport.

PREREQUISITE(S):
One of:
• C+ in Foundations of Math 11; C in Pre-calculus 11; C in MATH 073; C in MATH 077; C in MATH 137
CO-REQUISITE(S):
Not Applicable
EXCLUSION(S):
Not Applicable

COURSE LEARNING OUTCOMES / OBJECTIVES

Upon completion of this course a student will be able to:

1. Answer, in written form, brief conceptual questions on the scope of biomechanics.
2. Solve technical problems:
• involving units of scientific measurement, derived S.I. units, unit conversions.
• involving forces in one dimension.
• of force and linear kinematics with constant acceleration.
• of momentum and impulse in one dimension.
• of mechanical work, energy and power.
• involving rotational quantities and kinematic relationships.
• of torque, rotational kinematics, and angular momentum.
• involving centre of mass.
• of fluid bouyancy, lift and drag.
• demonstrate proficiency in qualitative and quantitative biomechanical analysis of a sport activity.
3. Assemble simple experimental apparatus using written instructions.
4. Observe, record, organize and display data in tables, graphs or charts.
5. Analyze linear graphs (determine area, slope, intercept, etc.).
6. Interpret meaning of experimental results in the context of the experimental objectives.

REQUIRED MATERIALS & RECOMMENDED PREPARATION / INFORMATION

- Recommended Textbook: Biomechanics of Sport and Exercise 4th Edition with Web Resource by McGinnis, Peter M. (copy available on reserve in Camosun Library)
- PHYS 160 Lab Manual: (provided online at D2L)
- Basic Scientific Calculator (available at Camosun Bookstore)
- Drawing Set (available at Camosun Bookstore)
- Access to computer or laptop computer with MS OFFICE (Word, Excel)

Excel is available as part of the Office 365 suite provided free to all Camosun students. See: http://camosun.ca/services/its/other-services.html for details.

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. Please see PHYS 160 Timeline at the end of this document.

WEEK or DATE RANGE	ACTIVITY or TOPIC	OTHER NOTES
Week 3	Midterm CK #1	F 8:30 am (1hr)
Week 6	Midterm CK #2	F 8:30 am (1hr)
Week 9	Midterm CK #3	F 8:30 am (1hr)
Week 12	Midterm CK #4	F 8:30 am (1hr)

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

DESCRIPTION	WEIGHTING
Homework Assignments (weekly)	10
Laboratory Reports	10
Midterms (CK) (4 and drop lowest mark)	30
Biomechanics Analysis	10
Final CK	40
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, announcements, and important class information will be posted on D2L. Students must check D2L regularly.
- Homework will be assigned every week and will be submitted to D2L folders
- Four (4) midterm tests will occur at the dates and times listed below. Out of the four midterm tests, the lowest midterm grade will be dropped for each student to make up the 30% weighting.
- The lab reports will be submitted to D2L folders. Lab reports are due ONE WEEK after the date of the lab exercise.

SCHOOL OR DEPARTMENTAL INFORMATION

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 illness and emergency circumstances. Holidays or scheduled flights are not considered to be emergencies.
- Missed exams normally receive a zero grade. Instructors are not required to provide make-up tests.

PHYSICS DEPARTMENT GUIDELINES REGARDING LABS:

Laboratory activities involve practical applications of your knowledge and manual skills development. Development of these skills is a requirement to meet the Course Learning Outcomes.

- Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.
- Unless otherwise stated by your instructor, late penalties are as follows: For overdue labs, a late penalty of 10% per day will be assessed following the due date.-

- 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.

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.
- You can miss one laboratory session without penalty, and you are still eligible to meet the Learning Outcomes for the course.
- 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

GENERAL IN-PERSON ASSESSMENT RULES FOR STUDENTS – PHYSICS AND ASTRONOMY DEPARTMENT:

The rules are used for on-campus quizzes, tests, and exams in the Physics and Astronomy department. A Faculty member will actively supervise throughout the examination. The instructor may move around the room or sit at the front or back of the room.

By entering the exam room, students agree to abide by the following rules:

- Turn off all electronic communication devices (including, but not limited to: cellphones, smartwatches, laptops, tablets) before entering and place them on a designated table at the front of the exam room.
- All bags must be on the sides, back, or front of the room – the instructor will identify the appropriate place.
- Students are not permitted to wear brimmed hats or hoodies during in-person assessments.
- Students may bring pens, pencils, calculator, highlighters, erasers, ruler, protractor, and a drink in a closed container. If permitted in the room, students may have a snack in its original packaging or a clear container.
- Calculators must be scientific, non-textual calculators, with no notes of any kind in the case.
- Items brought into the room may be inspected by the Faculty member.
- If you arrive late for the examination, no additional time will be provided. Students arriving more than 30 minutes late may not be allowed to enter the room.
- For biological breaks, permission to leave the exam room must be obtained. Only one student at a time may leave the room, and biological breaks must be as brief as possible.
- Access to any online materials during exams is prohibited.
- Any work submitted on an examination must be entirely your own.
- Students found communicating with one another in any way or under any pretext; having unathorized books, papers, electronic computing devices, data storeage, or communication devices in view, even if their use is not proved; or found cheating in any way may receive a zero grade. All incidents will be recorded and managed according to the College's Academic Integrity Policy.

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.

PHYSICS 160 X01AB
TIMELINE 2025W

CK = Celebration of Knowledge (test)

Week	*Lecture 1 Monday (11:30)*	*Lecture 2 Tuesday (12:30)*	*Lecture 3 Wednesday (12:30)*	*Laboratory Thursday (10:30)*	*Lecture 4 Friday (8:30)*
1 Jan 6 –10	Introduction (Scope of Biomechanics) 1.1	Anatomy; Physiology; Movement 1.2 1.3	Scientific Notation; Calculators 2.1	Group A Lab 1 Density	SI Units; Unit Conversions 2.2
2 Jan 13 – 17	Algebra Review; Solving Word Problems 2.3	Vectors/Scalars Position and Displacement 3.1 3.2	Average Speed Average Velocity 3.3	Group B Lab 1 Density	Acceleration & 1D Kinematics 3.4
3 Jan 20 – 24	Acceleration & 1D Kinematics 3.5	Graphical Analysis of 1D Kinematics 3.5	Vector Addition In 2D 3.6	Group A LAB 4 Acceleration in 1D	**CK #1**
4 Jan 27 – 31	Projectiles 3.7	Intro to Forces Types of Forces F.B.D. 4.1	Newton's 1st Law 4.2	Group B LAB 4 Acceleration in 1D	Newton 2nd Law Force & Kinematics 4.3
5 Feb 3 – 7	Newton 2nd Law Force & Kinematics 4.3	Newton 2nd Law Force & Kinematics 4.3	Newton 2nd Law Force & Kinematics 4.3	Group A 2D Vector Algebra (handout not in manual)	Newton 2nd Law Force & Kinematics 4.3
6 Feb 10 – 14	Newton 3rd Law 4.4	Forces in Fluids 4.5	Forces in Fluids 4.5	Group B 2D Vector Algebra (handout not in manual)	**CK #2**
7 Feb 17 – 21	***FAMILY DAY (College Closed)***	***READING BREAK (College Closed)***	***READING BREAK (College Closed)***	***READING BREAK (College Closed)***	***READING BREAK (College Closed)***
8 Feb 24 – 28	Week of Program Tests (practical)	Week of Program Tests (practical)	Week of Program Tests (practical)	Group A LAB 2 Elasticity	Momentum Introduction
9 Mar 3 – 7	Impulse and Momentum 4.7	Momentum Conservation of Momentum 4.6	Momentum Conservation of Momentum 4.6	Group B LAB 2 Elasticity	**CK #3**
10 Mar 10 – 14	Forms of Energy 5.1	Kinetic Energy Potential Energy	Kinetic Energy Potential Energy	Group A LAB 5 Analysis of Olympic Runners	Kinetic Energy Potential Energy
11 Mar 17 – 21	Mechanical Work 5.2	Mechanical Work 5.2	Conservation of Energy 5.3	Group B LAB 5 Analysis of Olympic Runners	Conservation of Energy 5.3

12 Mar 24 – 28	Power 5.4 Torque 6.2	Centre of Mass 6.1 Static Equilibrium 6.3	Static Equilibrium 6.3	Group A LAB 6 Torque and Body Mechanics	**CK #4**
13 Mar 31 – Apr 4	Static Equilibrium 6.3	Static Equilibrium 6.3	Linear and Angular Displacement 7.1	Group B LAB 6 Torque and Body Mechanics	Linear and Angular Displacement 7.1
14 Apr 7- 11	Angular Velocity 7.2	Angular Kinematics Equations 7.3		Biomechanical Analysis	REVIEW

FINALS April 14 - 25
April 18 Good Friday
April 21 Easter Monday