

# COURSE SYLLABUS



COURSE TITLE: Phys 160 – Biomechanics of Sport

CLASS SECTION: X01

TERM: Winter 2022

COURSE CREDITS: 4

DELIVERY METHOD(S): Lecture

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](#)

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For COVID-19 information please visit <https://legacy.camosun.ca/covid19/index.html>.

*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 explanation in advance, you will be removed from the course and the space offered to the next waitlisted student.*

## INSTRUCTOR DETAILS

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NAME: Julie Alexander

EMAIL: [jalex@camosun.bc.ca](mailto:jalex@camosun.bc.ca)

OFFICE: Tech 220

HOURS: M 12:30-2:00, T 10:30-11:30, W 2:30-3:00, F 11:30-12:00

*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

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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

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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

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Scientific Calculator

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

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### Course Content and Schedule

Lecture:	Monday 2:00-3:00
Lecture:	Tuesday 11:30-12:30
Tutorial	Wednesday 3:00-4:00
Lecture:	Thursday 9:30-10:30
Lab:	Friday 9:30-11:30

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

**PHYSICS 160 Section X01  
TIMELINE 2022 Winter**

<i>Week</i>	<i>Lecture 1 Monday</i>	<i>Lecture 2 Tuesday</i>	<i>Lecture 3 Wednesday (Tutorial)</i>	<i>Lecture 4 Thursday</i>	<i>Laboratory Friday</i>	
1 Jan 10-14	Introduction to Biomechanics	Calculators, Algebra, converting units,	Muscles, human motion, algebra, units	Trigonometry and components of vectors	No Lab	
2 Jan 17-21	Forces (Weight, Tension, Normal, Friction)	Adding Vectors using components	Free body diagrams, vectors, calculating net force	Equilibrium of Forces	<b>Lab 1</b>	
3 Jan 24-28	Equilibrium of Forces	Equilibrium of Forces	Equilibrium Assignment	Review	No Lab	
4 Jan 31 Feb 4	<b>Test #1 Jan 31</b>	Pressure	Worksheet on Pressure	Center of Mass	<b>Lab 2</b>	
5 Feb 7-11	Center of Mass	Torque	Center of Mass Assignment	Torque	No Lab	
6 Feb 14-18	Torque	Torque	Torque Assignments	Review	<b>Lab 3</b>	
7 Feb 21-25	<b>FAMILY DAY (College Closed)</b>	<b>READING BREAK (College Closed)</b>	<b>READING BREAK (College Closed)</b>	<b>READING BREAK (College Closed)</b>	<b>READING BREAK (College Closed)</b>	
8 Feb 28 Mar 4	<b>Test #2 Feb 28</b>	No class Exam week	No class Exam week	No class Exam week	No Lab Exam week	
9 Mar 7-11	Kinematics	Kinematics	Kinematics Worksheet	Free fall	<b>Lab 4</b>	
10 Mar 14-18	Newton's Laws	Newton's Laws	Kinematics Assignment	Newton's Laws	No Lab	
11 Mar 21-25	Forces in Jumping	Stress and Strain	Newton's Laws Assignment	Review	<b>Lab 5</b>	
12 Mar 28 Apr 1	<b>Test #3 Mar 28</b>	Stress and Strain	Stress and Strain Assignment	Simple Machines	<b>Lab 6</b>	
13 Apr 4-8	Simple Machines	Simple Machines	Simple Machines Assignment	Climate Change talk	Lab catch up	
14 Apr 11-14	Review	Review	Review	Review	<b>Good Friday (no lab)</b>	

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 notice is required. Deadlines can be reviewed on the [CAL exams page](http://camosun.ca/services/accessible-learning/exams.html). <http://camosun.ca/services/accessible-learning/exams.html>

## EVALUATION OF LEARNING

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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](http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf) policy for more information. <http://camosun.ca/about/policies/education-academic/e-1-programming-and-instruction/e-1.14.pdf>

• Final Exam(3 hours)	45%
• Homework problems	10%
• 3 term tests (1 hour each)	30%
• Labs (all labs MANDATORY)	<u>15%</u>
	100%

### Important dates

Proposed dates for 1 hour tests

Jan 31, 2022

Feb 28, 2022

Mar 28, 2022

## COURSE GUIDELINES & EXPECTATIONS

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### Homework

Homework problems are designed to help you master problem solving skills and prepare you for the term tests.

You will be given a set of homework problems at the beginning of the tutorial each week. You will spend the hour working on these problems with the help of classmates and the instructor. At the end of the tutorial the instructor will stamp your stamp sheet. You may not be able to complete all of the problems during this hour, that is OK, you will still be given a stamp but then will be expected to complete the rest of the problems on your own time. At the end of the term stamp sheets will be collected and count towards 10% of your final grade. Test questions will be based on these problems so you want to be sure that you work through all of them. Full solutions will be posted on D2L. Your instructor has also made videos of many of these problems. The Youtube links for these videos are listed on D2L.

**PHYSICS DEPARTMENT GUIDELINES REGARDING TESTING AND GRADING:**

- The final exam will cover the entire course and will be 3 hours long. 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 quizzes, 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.
- Any outstanding labs must be submitted prior to the last day of classes, and will be graded according to the late policy outlined by the instructor.
- Announcements and important class information will be posted on D2L. Students should check D2L regularly.

**PHYSICS DEPARTMENT GUIDELINES REGARDING LABS:**

- Students must obtain an overall grade of 50% or higher in the laboratory component of the course order to obtain credit for the course.
- Attendance is mandatory & you may be required to “sign in” at the beginning of each lab period. A lab may be waived or made up at a later time only in the case of documented illness or other extenuating circumstances. If you will be absent from a lab period due to illness it is your responsibility to notify your instructor.
- Unless otherwise stated by your instructor late penalties are as follows: For overdue labs (or assignments), a late penalty of 1 mark per day (10%) will be assessed for the first five days following the due date. After this date a complete report is still required and earns a maximum mark of 50%.
- 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

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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

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

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.

### 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](http://camosun.ca/sexual-violence). To contact the Office of Student Support: [oss@camosun.ca](mailto: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.