



INTRODUCTION TO
Biomechanics

KIN 216 | 2022W Term 2m 1



Welcome to the Biomechanics course! My name is Dr. **Kayla** Fewster and it is my pleasure to work with you this term. This is an introductory course in biomechanics. Some that have taken physics recently will find that concepts are reviewed throughout. Others that haven't taken those courses may be overwhelmed at the thought of taking a course about the principles of mechanics. It doesn't matter what your background is coming into this course. My job, as the instructor, is to provide every student with the foundational knowledge necessary to understand the application of mechanics.



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Tutorial sessions (Osborne, KLC, G1):

LEARNING OBJECTIVES

By the end of this course, students will be able to:

- ▶ Identify the goals of biomechanics and the common tools used to achieve these goals
- ▶ Distinguish between linear, angular, and general forms of motion
- ▶ Describe the relationships among kinematic and kinetic variables
- ▶ **Understand and apply the steps of quantitative reasoning**
- ▶ Solve quantitative problems involving kinematic and kinetic quantities and the relationships between linear and angular variables
- ▶ Identify Newton's Laws of Motion and describe practical examples of the Laws
- ▶ Explain how forces create and affect movement



STUDY TIPS.....

And other helpful suggestions



Make a Study Plan

Schedule so many hours per day or week to keep on top of your coursework. Create goals that are clear and reasonable (achievable).



Manage Your Time

Make time for schooling. Estimate how much time you need for studying, working on assignments. But, make sure to set aside some time to unwind.



Work with Others

Find a study buddy. Join a study group. Share notes, work on problems together, or create your own tests. Working with others can make learning more enjoyable (and help address any questions you might have).



Be an Active Learner

Put your phone away and focus on what is being discussed. Take notes. Try to apply what you learn in the classroom, to something outside the classroom.

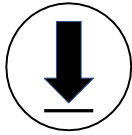


Ask questions

If you need help, ask for it. If you don't understand something, please reach out to your instructor.

CLASS EXPECTATIONS

Summary of some of the key expectations for this course:



DOWNLOAD

Go to the course website and gather the materials you will need for each lecture. Read ahead, complete any tasks so that you are ready for class.



ATTEND

It is important to come to class regularly and keep up with course content.



PARTICIPATE

A course is much more rewarding if you fully participate. Get involved in the learning process and participate in activities and discussions.



RESPECT

Everyone must be treated with respect. Please be mindful of your interactions with others, either on discussion boards or during meetings.



FOCUS

Avoid using electronic devices for anything other than taking notes, or following the lecture.



CHECK IN

You are responsible for all material covered in class and any information given whether in attendance or not. .

EVALUATION

Your final grade will be determined based on your marks from the following assessments. There are NO OPPORTUNITIES TO EARN EXTRA CREDITS. So, please pay attention to the dates and deadlines so that you are prepared to complete the following. And if something arises, please talk to your instructor as soon as possible.

1

Midterms (25% each)

There will be 2 midterm tests during this term. The tests will consist of multiple-choice, short answer, and problem-solving questions. Each test will ONLY cover material prior to each midterm.

2

Labs/Experiential Assignments (20%)

7 applied biomechanics assignments/labs will be assigned throughout the term. The purpose of these assignments is to apply the knowledge gained in class to real world biomechanics applications. Assignments will be weighted equally across the 20 .

Final Exam (30%)

The final unit test will be held during the formal examination period. This exam will be similar to the midterm tests. This exam will cover all material discussed during the course

COMMUNICATION

When in doubt.....ask!!!

AL



Tutorials and Office Hours are available to help you understand course content. Please use this time to practice assigned problems and ask questions as needed.

WEBSITE



Announcements, handouts, and other materials are regularly posted on your course website. Please make sure that you are checking the Canvas site regularly and keeping up with the material.

UNIVERSITY POLICIES

Academic Honesty and Standards

Academic honesty is essential to the continued functioning of the University of British Columbia as an institution of higher learning and research. All UBC students are expected to behave as honest and responsible members of an academic community. Breach of those expectations or failure to follow the appropriate policies, principles, rules, and guidelines of the University with respect to academic honesty may result in disciplinary action.

It is the student's obligation to inform himself or herself of the applicable standards for academic honesty. Students must be aware that standards at the University of British Columbia may be different from those in secondary schools or at other institutions. If a student is in any doubt as to the standard of academic honesty in a particular course or assignment, then the student must consult with the instructor as soon as possible, and in no case should a student submit an assignment if the student is not clear on the relevant standard of academic honesty.

If an allegation is made against a student, the Registrar may place the student on academic hold until the President has made his or her final decision. When a student is placed on academic hold, the student is blocked from all activity in the Student Service Centre.

Resources to Support Student Success

UBC provides resources to support student learning and to maintain healthy lifestyles but recognizes that sometimes crises arise and so there are additional resources to access including those for survivors of sexual violence. UBC values respect for the person and ideas of all members of the academic community. Harassment and discrimination are not tolerated nor is suppression of academic freedom. UBC provides appropriate accommodation for students with disabilities and for religious observances. UBC values academic honesty and students are expected to acknowledge the ideas generated by others and to uphold the highest academic standards in all of their actions.

Details of the policies and how to access support are available on the [UBC Senate website](#).

Academic Accommodation for Students with Disabilities

The University of British Columbia recognizes its moral and legal duty to provide academic accommodation. The University must remove barriers and provide opportunities to students with a disability, enabling them to access university services, programs, and facilities and to be welcomed as participating members of the University community. The University's goal is to ensure fair and consistent treatment of all students, including students with a disability, in accordance with their distinct needs and in a manner consistent with academic principles.

Students with a disability who wish to have an academic accommodation should contact Centre for Accessibility without delay.

Copyright

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Week	Day	Location	Class Topic	Due this week
Week 1: January 9 to 13	Tuesday	FRDM 153	Welcome to KIN 216!	
	Thursday	FRDM 153	Lecture 1: Math Review	
Week 2: January 16 to 20	Tuesday	FRDM 153	Lecture 2: Linear Kinematics I	
	Thursday	FRDM 153	Lecture 3: Linear Kinematics II/Lab 1 Assigned	
Week 3: January 23 to Jan 27	Tuesday	FRDM 153	Lecture 4: Motion Capture - Example/Lab 2 Assigned	Lab 1 Due
	Thursday	FRDM 153	Lecture 5: Forces I	
Week 3: January 30 to Feb 3	Tuesday	FRDM 153	Lecture 6: Forces II	
	Thursday	FRDM 153	Lecture 7: Linear Kinetics I	
Week 4: February 6 to 10	Tuesday	FRDM 153	Lecture 8: Linear Kinetics II/Lab 3 Assigned	
	Thursday	FRDM 153	Exam Review	Lab 2 Due
Week 5: February 13 to 17	Tuesday	FRDM 153	Midterm Exam #1 (25%), Tuesday, February 14 Covers Lectures 1 to 8, Labs 1 & 2	
	Thursday	FRDM 153	Lecture 9: Angular Kinematics I	
Week 6: February 20 to 24	Tuesday	FRDM 153	No Class - Midterm Break	
	Thursday	FRDM 153	No Class - Midterm Break	
Week 7: February 27 to March 3	Tuesday	FRDM 153	Lecture 10: Angular Kinematics II/Lab 4 Assigned	Lab 3 Due
	Thursday	FRDM 153	Lecture 11: Moments I	
Week 8: March 6 to 10	Tuesday	FRDM 153	Lecture 12: Moments II/Lab 5 Assigned	Lab 4 Due
	Thursday	FRDM 153	Lecture 13: Angular Kinetics I	
Week 9: March 13 to 17	Tuesday	FRDM 153	Lecture 14: Angular Kinetics II/Lab 6 Assigned	Lab 5 Due
	Thursday	FRDM 153	Exam Review	
Week 10: March 20 to 24	Tuesday	FRDM 153	Midterm Exam #2 (25%), Tuesday, March 21 Covers Lectures 9 to 14, Labs 3 to 5	
	Thursday	FRDM 153	Mechanics of Biological Materials I	Lab 6 Due
Week 11: March 27 to 31	Tuesday	FRDM 153	Mechanics of Biological Materials II	
	Thursday	FRDM 153	Tissue Mechanics - Practical Example Lab 7	
Week 12: April 3 to 7	Tuesday	FRDM 153	Applications of Biomechanics	
	Thursday	FRDM 153	Applications of Biomechanics	
Week 13: April 10 to 15	Tuesday	FRDM 153	Injury Biomechanics	
	Thursday	FRDM 153	Final Exam Review	Lab 7 Due

Final exam during the April 17th to 28th final exam period (30%).

Covers All Lectures and All Labs

The class schedule is subject to change. Students are responsible for class announcements concerning course information and schedule changes.