



# KINE 4475 Clinical Biomechanics Fall 2021

## **COURSE INSTRUCTOR**

Instructor: Dr. Jaclyn Hurley  
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Teaching Assistant: Matthew Russell ([msr@yorku.ca](mailto:msr@yorku.ca))  
Office Hours: Virtual Appointment

## **COURSE INFORMATION**

Lectures: Monday/Wednesday, 11:30 am – 1:00 pm  
*Combination of:*

- In-class Lectures (DB 1004)
- Online Posted Lectures
- Online Synchronous Lectures/Activities

Labs: Wednesday  
*Combination of:*

- 1:00pm – 2:00pm, SC 101A
- 2:00pm – 3:00pm, SC 101A
- Online Synchronous

\*Note: not every week. Lab groups will be assigned.

Webpage: <https://eclass.yorku.ca/>

## **PREREQUISITE / CO-REQUISITE**

HH/KINE 3030 3.0 – Biomechanics of Human Movement

Please note: It is strongly recommended that HH/KINE 2031 3.0 – Human Anatomy be completed prior to enrolling in HH/KINE 4475 – Clinical Biomechanics.

## **EXPANDED COURSE DESCRIPTION**

Quantitative biomechanical techniques are used to evaluate musculoskeletal injuries as well as examine pathological movement. Standard biomechanics techniques and modelling methods are combined with an understanding of tissue mechanics to quantitatively evaluate injury mechanisms and rehabilitation of tissues (bone, ligament, tendon, muscle). After developing an understanding of each tissue's response to various loading conditions, specific injuries are

evaluated based on load-tolerance criteria. In addition to examining specific injuries the course examines how injury and specific medical conditions affect movement.

The course involves formal lectures given by the Professor. Lectures may be supplemented by videos, student presentations, and guest speakers where appropriate. Suggested readings including selected textbooks (available on reserve), and supplement information will be provided in lecture. Additional journal articles may be assigned. Students are expected to follow the course schedule and attend synchronous sessions prepared (completed readings, up to date with material), to take notes, and participate. Students are also expected to take notes on the important concepts from the readings that are assigned and/or discussed during lecture.

### **COURSE LEARNING OBJECTIVES**

1. Discuss and apply different biomechanical techniques to evaluate musculoskeletal injuries and pathological movement.
2. Describe several factors that affect tissue mechanics and musculoskeletal injury.
3. Differentiate biomechanical outcomes between a variety of clinical populations and unaffected populations, specifically in spine, upper limb and gait research.
4. Critically evaluate and synthesize scholarly articles in the area of clinical biomechanics.
5. Develop pertinent written and oral skills.
6. Explain the problems encountered quantitatively evaluating injury mechanisms and the complexity of rehabilitation of tissues from a biomechanical perspective.

### **REQUIRED READINGS**

A list of scholarly articles relating to the variety of topics covered will be posted to eClass.

### **SUGGESTED READINGS (Available @ Steacie on Reserve)**

- Robertson DGE, Caldwell GE, Hamill J, Kamen B, Whittlesey SN. Research Methods in Biomechanics, 2<sup>nd</sup> Edition; Windsor, Ontario; Human Kinetics; 2013.
- Nordin M, Frankel BH. Basic Biomechanics of the Musculoskeletal System, 4<sup>th</sup> Edition; New York, USA; Lippincott, Williams, & Wilkins; 2012.
- Whiting WC, Zernicke RF. Biomechanics of Musculoskeletal Injury, 2<sup>nd</sup> Edition; Windsor, Ontario; Human Kinetics; 2008.
- Winter DA. Biomechanics and motor control of human movement, 4<sup>th</sup> Edition; Toronto, Ontario; John Wiley & Sons, Inc; 2009.

### **COURSE EVALUATION**

In-class Assignment	5%	Oct 25 & 27
Midterm	25%	Oct 18
Presentation & Paper**	25%	Paper (Nov 24), Presentation (TBA)
Lab Assignments	10%	Assignments (4) due one week following lab
Final Exam	35%	TBA

The Professor and TA will NOT be available to answer questions or provide clarification 24 hours prior to the deadline of the presentation, paper, midterm, and the final exam regardless if such inquiries are made in-person, by telephone, email, or any other communication forms.

Final course grades may be adjusted to conform to Program or Faculty grades distribution profiles.

## **COVID-RELATED INFORMATION & SCREENING**

This course will have a blended format. Both lectures and labs will be a combination of in-person/on campus and online. Students will have the ability to complete all course components online if they choose (i.e., attending in person will not be mandatory). Online lectures will be a combination of *synchronous*\* and *asynchronous*\*.

\*Synchronous: Students will be expected to sign onto Zoom during class time to attend a live lecture.

\*Asynchronous: A lecture recording will be posted to eClass for students to view prior to the next lecture.

### **All assessments will be online.**

As part of York's **Community of Care Commitment** all members of the York community share in the responsibility of keeping others safe on campuses. In this class, as elsewhere on campus, students must comply with all University health and safety protocols

(<https://www.yorku.ca/bettertogether/creating-a-community-of-care/>), including:

- Self-screening using the **YU Screen** tool (<https://yorku.ubixhealth.com/login>) prior to coming to campus for any in-person activities
- Not attending in-person activities at any of York University's campuses/locations when you are feeling unwell or if you answer YES to any of the screening questions
- Wearing masks or face covering that completely covers the mouth, nose and chin while on campus
- Avoiding eating and drinking in classrooms, research and in shared space where eating is explicitly not permitted (e.g., Libraries)
- Engaging in good hand hygiene
- Following instructions in designated spaces as they pertain to giving space to one another and/or protocols for entry to and exit from classrooms, instructional and other shared spaces (e.g., Libraries), when applicable

Information about COVID-19 health and safety measures can be found on the **Better Together** website (<https://www.yorku.ca/bettertogether/>). The Senate Executive Committee's **Principles to Guide 2021-2022 Course Planning** encourage us to uphold compassion, kindness, empathy, and a sense of responsibility towards one another

(<https://secretariat.info.yorku.ca/files/May-6-2021-Communication.pdf?x16396>). We all have a duty to uphold professional and respectful interactions with one another.

## **POLICIES**

### **Grading:**

The grading scheme for the course conforms to the 9-point grading system used in undergraduate programs at York (e.g., A+ = 9, A = 8, B+ = 7, etc.). Marked materials will bear either a letter grade designation or a corresponding number grade (e.g. A+ = 90 to 100, A = 80 to 90, B+ = 75 to 79, etc.). For a full description of York grading system see the York University Undergraduate Calendar -

[http://calendars.registrar.yorku.ca/pdfs/uq2004cal/calug04\\_5\\_acadinfo.pdf](http://calendars.registrar.yorku.ca/pdfs/uq2004cal/calug04_5_acadinfo.pdf).

It is the student's responsibility to review returned material to ensure that the marks earned are accurate. Any appeal for grade revision (a) must be received by the instructor within 7 calendar days of the date the work was returned to the class; (b) must be made in writing; and (c) must

explicitly state why you believe the mark is in error. Grade disputes after this 7 calendar-day period will not be considered. Individual questions or sections of an exam or assignment will not be re-marked, however you may request the entire document be re-marked, where your overall mark may increase, decrease or stay the same.

### **Lateness Penalty for Lab Reports and Assignments:**

*All students* will have 24 hours from the due date to submit assignments and laboratories. Marks allocated for assignments/laboratories received later than this extended 24-hour deadline will be re-weighted to the final exam.

For example: If a laboratory report is due Mon Oct 18, any student may submit up until Tues Oct 19 at 11:59pm. After this deadline the marks allocated for this laboratory report (i.e., 5% of total grade) will be allocated to the final exam.

### **Missed Exam:**

If you know in advance that you will not be able to write an exam on the scheduled date, please notify the instructor in writing at least 7 calendar days prior to the scheduled exam date. If an exam is missed due to unforeseen events, contact the instructor within 72 hours after the missed exam time and a deferred exam (or exam re-weighting for the case of a midterm) may be arranged. For any missed exam, you will be required to submit a Deferred Standing Agreement form ([https://registrar.yorku.ca/pdf/deferred\\_standing\\_agreement.pdf](https://registrar.yorku.ca/pdf/deferred_standing_agreement.pdf))

### **Email and Voicemail Policy:**

All electronic communication with the course instructor must be through your York University preferred email address and contain the course code in the subject line (KINE 4475). Emails are a form of communication and the spelling, grammar, and tone will reflect your communication skills. Students may address the Course Instructor as Dr. Hurley. Write emails using professional language that would be acceptable in a workplace to a manager. Include your first and last name, and York student ID# in emails. Emails in inappropriate form/language (ex. text messaging language – c u l8r, disrespectful, etc.) will not be read or returned. Depending on the level of clarification and/or number of questions per email (1-2 questions is appropriate), and frequency of emails, at the Course Instructor's discretion, emails may not be answered and a meeting with the student will be arranged and/or content addressed in class. Emails will only be responded to during work hours, 9 am to 5 pm, Monday through Friday, to ensure equal access is provided for all students in the course. The Course Instructor may also have an assigned email hour, when emails will be responded to immediately (dependent on demand). Again, the Course Instructor and TA will not respond to emails to answer questions or provide clarification within 24 hours before any deadline or exam time.

### **Student Code of Conduct:**

Students and Instructors are expected to maintain a professional relationship characterized by courtesy and mutual respect and to refrain from actions disruptive to such a relationship. Moreover, it is the responsibility of the instructor to maintain an appropriate academic, and the responsibility of the student to cooperate in that endeavour. Further, the Instructor is the best person to decide, in the first instance, whether such an atmosphere is present in the course. You must conduct yourself in accordance with York University's Student Code of Conduct. This includes in class, in lab, and online (Zoom, eClass, social media, etc.). You are responsible to ensure your behaviour is appropriate. A statement of the policy and procedures involving disruptive and/or harassing behaviour by students in academic situations is available <https://secretariat-policies.info.yorku.ca/policies/disruptive-andor-harassing-behaviour-in-academic-situations-senate-policy/>

### **Student Code of Rights and Responsibilities:**

This Code is intended to be educative and promote accountability among students toward their peers and other members of the York community. This Code identifies those behaviours that are disruptive to the educational purposes of the University, make the campus less safe, diminish the dignity of individuals and groups, and the enjoyment of their rights. It applies specifically to students because the behaviours of non-student members of the University community are held to comparable standards of account by provincial laws, University policies and their unions' collective agreements. Information about how to address a concern or a complaint regarding a faculty or staff member can be found at

<https://secure.students.yorku.ca/pdf/CodeofRightsandResponsibilities.pdf>

York is committed to civil discourse and the free and open exchange of ideas between community members and as such, nothing in this Code is intended as a method or excuse to suppress peaceful protest, civil debate or other lawful conduct so long as student responsibilities as outlined in Section 4 are being upheld.

<https://secure.students.yorku.ca/pdf/CodeofRightsandResponsibilities.pdf>

### **Plagiarism and Academic Integrity:**

Students are expected to maintain the highest standards of academic integrity related to issues such as cheating, plagiarism, authentic documentation, etc. Breaches of academic integrity will not be tolerated. Students should complete the online SPARK Academic Integrity module (**will receive 1 bonus mark on Midterm if completed by one week following the first class (Sept 15, 2021)**): <https://spark.library.yorku.ca/academic-integrity-what-is-academic-integrity/>

The School of Kinesiology & Health Science takes academic dishonesty very seriously and will abide by York University's Senate Policy on Academic Honesty to adjudicate all cases. Students are expected to make efforts to discourage any and all (un)intentional breaches from their course work. Students are expected to complete their own work without significant assistance, in part or whole, on assignments and exams. Students are expected to act in accordance with the Senate Policy on Academic Honesty and are responsible for familiarizing themselves with these guidelines. Breaches of academic integrity will be handled under the disciplinary proceedings as outlined in

<https://www.yorku.ca/secretariat/policies/policies/academic-honesty-senate-policy-on/>

### **Access/Differently Abled Students:**

York provides services for students with disabilities (including physical, medical, learning and psychiatric disabilities) needing accommodation related to teaching and evaluation methods/materials. It is the student's responsibility to register with accessibility services as early as possible to ensure that appropriate academic accommodation can be provided with advance notice. You are encouraged to schedule a time early in the term to meet with each professor to discuss your accommodation needs. Failure to make these arrangements may jeopardize your opportunity to receive academic accommodations. Requiring accommodation does not relieve students from following the course policies. Additional information:

<https://accessibility.students.yorku.ca/>

### **IMPORTANT COURSE INFORMATION FOR STUDENTS**

All students are expected to familiarize themselves with not only the above information, the information posted on the course eClass site, but also the following information which is available on the Senate Committee on Curriculum & Academic Standards webpage (see Reports, Initiatives, Documents): <http://secretariat.info.yorku.ca/senate/>

- York's Academic Honesty Policy and Procedures/Academic Integrity Website
- Ethics Review Process for research involving human participants
- Course requirement accommodation for students with disabilities, including physical, medical, systemic, learning and psychiatric disabilities
- Student Conduct Standards
- Student Right and Responsibilities
- Religious Observance Accommodation
  - Contact the Course Director within the first three weeks of class to notify of conflicts with labs and/or midterms and as soon as possible for the final exam.