



# KINE 4475 Clinical Biomechanics Fall 2023

## **COURSE INSTRUCTOR**

Instructor: Dr. Jaclyn Hurley  
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Teaching Assistant: Stephen Boulanger ([sbou11@yorku.ca](mailto:sbou11@yorku.ca))  
Office Hours: Virtual Appointment

## **COURSE INFORMATION**

Lectures: Monday, 10:00 am – 11:30 am (SC 212)  
Wednesday, 10:00am – 11:30am (SC 212)

Labs: Thursday, 1:30pm – 2:30pm (SC 101A)  
\*Note: not every week.

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, 3<sup>rd</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, 3<sup>rd</sup> Edition; Toronto, Ontario; John Wiley & Sons, Inc; 2009.

### **COURSE EVALUATION**

In-class Assignment	5%	Oct 23 & 25
Midterm	25%	Oct 16
Presentation & Paper**	25%	Paper (Nov 22), Presentation (TBA)
Lab Assignments	10%	Assignments (4) TBA
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.

## **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/ug2004cal/calug04\\_5\\_acadinfo.pdf](http://calendars.registrar.yorku.ca/pdfs/ug2004cal/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 Assignments/ Missed Assignments (Including Lab Assignments):**

Assignments received later than the due date will be penalized by 50% for the first calendar day (including weekends) that the assignment is late, followed by 25% for each additional day. The first 50% will be deducted if the assignment is not submitted by the beginning of class, and an additional 25% will be deducted for each 24-hour increment that the assignment is late.

Exceptions to the lateness penalty for valid reasons such as illness, compassionate grounds, etc., may be considered by the Course Instructor but will require acceptable supporting documentation (e.g., medical or equivalent compassionate documentation) that must be verifiable, and the Course Instructor must be notified within 72 hours after the missed deadline. Alternate arrangements are not automatic, but MAY be made at the discretion of the Course Instructor.

If a lab is missed, acceptable supporting documentation (e.g. medical or equivalent compassionate documentation) must be verifiable for any accommodation to be received. It is unlikely that a make-up will be available due to the type of most of the lab assignments. In these cases where an accommodation has been approved by the Course Instructor the weighting of the lab assignment will be added 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 you must notify the instructor in writing at least 7 calendar days prior to the scheduled exam date. For unforeseen events, if the instructor is provided acceptable and verifiable medical (or equivalent compassionate) reasons within 72 hours after the missed exam time, a makeup midterm or deferred final MAY be able to be written if offered. Alternate arrangements are not automatic, but MAY be made at the discretion of the Course Instructor. Further extensions or accommodation beyond any initial arrangements will require students to submit a formal petition to the Faculty. 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 13, 2023)**): <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.