

School of Kinesiology
Faculty of Health Sciences
Western University

**KIN 4520B – CLINICAL BIOMECHANICS
WINTER 2019**

Instructor: Dr Jim Dickey

Location: TBD

Lectures: Monday/Friday 1:30-2:20

Laboratories: TBD

TAs: TBD

Office: Thames Hall 3159A

Office Hours: arranged by email

Instructor Contact: (email preferred)

Phone: 519-661-2111 x87834

Email: jdickey@uwo.ca

NOTE: All course information including grades, assignment outlines, deadlines, etc. are available via OWL. Check the website regularly for course announcements.

Calendar Course Description:

This course is designed to explore the theoretical basis of clinical biomechanics and develop hands-on skills necessary to work in the area. Special emphasis will be in the areas of: Posture and Balance, Gait, and Orthopaedic Biomechanics

Students will need a calculator with trigonometric functions. Please, bring your calculator to ALL lectures and lab sessions.

NOTE: YOU WILL NOT BE PERMITTED TO USE YOUR PHONE AS A CALCULATOR IN ANY QUIZES OR EXAMINATIONS.

Anti-requisite(s)|Pre-requisite(s)|Co-requisite(s)

You are responsible for ensuring that you have successfully completed all course pre-requisites, and that you have not taken an anti-requisite course.

Unless you have either the requisites for this course or written special permission from your Dean to enroll in it, you may be removed from this course and it will be deleted from your record. This decision may not be appealed. You will receive no adjustment to your fees in the event that you are dropped from a course for failing to have the necessary prerequisites.

Course Format:

Lectures: Tuesdays 10:30-12:30, Thursdays 10:30-11:30

Location TBD

Laboratories: One of: Mondays 4:30-6:30, Wednesdays 12:30-2:30, Wednesdays 2:30-4:30

Recommended Text: No required text. Lecture notes will be distributed through OWL

Learning Outcomes:

The students will learn the theoretical underpinnings of Clinical Biomechanics through discussion of Posture and Balance, Gait, and Orthopaedic Biomechanics. The students will be exposed to different biomechanical measurements and analyses in the laboratory components of the course. The students will gain hands-on experience in the small-group research project component of the course.

Upon completion of this course students will be able to:

1. **Identify and delineate** theoretical terms, concepts, and fundamental principles related to specific topics within Clinical Biomechanics such as Posture and Balance, Gait, and Orthopaedic Biomechanics (Knowledge)
2. **Compare and contrast** different theoretical approaches to specific topics within Clinical Biomechanics, such as standing balance and risk of falling. (Analysis)
3. **Develop** hands-on research skills through the small-group research project (Application)
4. **Further develop** abilities to *critically reflect* upon own learning and relate to the topics discussed in class. (Reflection)

Required Course Material:

All required readings and lecture notes will be posted on OWL.

Course Evaluation Summary: (this is an example)

1.	Lab Quizzes	10%
2.	Small-Group research project written report	20%
3.	Small-Group research project presentation and abstract	5%
4.	Mid Term (February 19 th , in class)	25%
5.	Final Exam	40%

Course Evaluation Details:

1. Labs will be announced in class and on OWL. The laboratory evaluations are comprised of short-answer quizzes completed at the end of the laboratory sessions.

2. Small-Group research projects:

The scope of these projects is to replicate a published research study. Suggested topics include balance or gait, as the background for these topics will be covered in class in the first part of the term. The purpose of these projects is to provide a hands-on laboratory experience tailored to the interests of the group. Students will pick groups of 4 or 5 members from the students in the same lab section. These groups must pick a research study to replicate that must be 1) based within Clinical Biomechanics, 2) must involve collecting and analyzing data, and 3) must use available equipment and software (i.e. force plate). Within each lab section, each project must be unique (based on a different published research study), and must be pre-approved by Dr. Dickey.

The steps include picking a group and approval of the published research article, organizing hardware and software requirements, started data collection, started analyzing the data, writing the final report. A draft copy of the introduction and methods sections, including proper citations and references, should be submitted to enable feedback. Deliverables at the end of the project include an abstract (including the purpose of the study and the main results), and the group will present their project in class. The final report is in the form of a complete manuscript based on the data collected for the group project. The final project must be handed

in as both paper and electronic (matching) versions. While your paper may be similar to the article that you are replicating, it should also include additional current pertinent references, and the discussion should be tailored to your particular project, data and interests.

Part of the evaluation will be based on grades ascribed by group consensus. The midterm evaluation must include a detailed summary of the group's progress. This process is intended to ensure that the project is on track, that there is an even distribution of effort among the group members, and that adequate timely feedback is provided to all group members.

The final reports will be graded based on content, clarity and professionalism.

The project should be written up for submission to The Western Undergraduate Research Journal: Health and Natural Sciences (WURJHNS). Information about the formatting requirements is available at <http://ir.lib.uwo.ca/wurjhns/>. Please consider using bibliographic citation management software such as Mendeley (<https://www.lib.uwo.ca/essayhelp/mendeleyquickstartguide.html>). Please consider the differences between essays and scientific writing --- you are writing a scientific paper, not an essay (Wagner PD. Writing Up Your Research Results for Publication. Chest 2009;136:639-642).

Several projects from previous years have been successfully published in WURJ-HNS:

Nielson C, Deegan E, Hung A, Nunes A (2010) Potential Effects of Sleep Deprivation on Sensorimotor Integration during Quiet Stance in Young Adults. WURJ Health and Natural Sciences 1: Article 5.
<http://ir.lib.uwo.ca/wurjhns/vol1/iss1/5/>

Delgado G, Coghlin C, Earle K, Holek A, O'Hare K (2011) Trunk extensor muscle fatigue does not affect postural control during upright static stance in young-adults and middle-aged adults. WURJ: Health and Natural Sciences 2: Paper 2.
<http://ir.lib.uwo.ca/wurjhns/vol2/iss1/2/>

Grey T, Redguard R, Wengle R, Wegscheider P (2013) Effect of Plantar Flexor Muscle Fatigue on Postural Control. Western Undergraduate Research Journal Health and Natural Sciences 4: 1-7.
<http://ir.lib.uwo.ca/wurjhns/vol4/iss1/1>

Baker C M and Barkwell G E (2017) Regulation of Balance After Spinning: A Comparison Between Figure Skaters and Controls, WURJ: Health and Natural Sciences, 7: Article 5.
<https://ir.lib.uwo.ca/wurjhns/vol7/iss1/5>

Cogswell F. D., Huang F, and Dietze B (2017) The Effects of Upper-Body and Lower-Body Fatigue on Standing Balance, WURJ: Health and Natural Sciences, 7: Article 12.
<https://ir.lib.uwo.ca/wurjhns/vol7/iss1/12>

Cohen J W, Lee P, and Buchman-Pearle J. (2017) The Effects of Footwear on Squat Movements, WURJ: Health and Natural Sciences, 8: Article 30.
<https://ir.lib.uwo.ca/wurjhns/vol8/iss1/30>

Smith W J, Richards D J, Zhou S H, Kennedy T. (2017) The Effect of Plantar Flexor Fatigue and Cognitive Recall Task on Standing Balance, WURJ: Health and Natural Sciences, 8: Article 14.
<https://ir.lib.uwo.ca/wurjhns/vol8/iss1/14>

3. The small-group project's abstract and presentation will be graded based on their content, clarity and professionalism.

4. The midterm covers material covered in classes and labs to that point in the term. It will be comprised of short-answer questions and interpretations.

5. The final exam is cumulative, covering material covered in classes and labs from the entire term. It will be comprised of short-answer questions and interpretations.

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Course/University Policies

1. **Lateness/Absences:** Laboratory evaluations are completed at the end of the laboratory experiences, and will not be accepted late, except under medical or other compassionate circumstances. Appropriate documentation for assignments worth less than 10% should be submitted to the instructor. A missed mid-term examination without appropriate documentation will result in a zero (0) grade.

2. **Written documentation:** Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. stating specific reasons and dates. Students must follow up with their professor and their Academic Counselling office in a timely manner. Documentation for medical requests (which should be obtained at the time of the initial consultation with the physician or walk-in clinic) for accommodation, must be submitted directly within two (2) business days after the end date on the documentation, to the appropriate Academic Counselling office of the student's Faculty/School of registration (e.g. KIN students will submit to the KIN Undergraduate Office), not to the instructor. An "Accommodation Consideration Request Form" found online or in the Kinesiology Undergraduate Office" for ALL accommodation requests must be submitted into the appropriate Academic Counselling office of the student's Faculty/School of registration. These documents will be retained in the student's file, and will be held in confidence in accordance with the University's Official Student Record Information Privacy Policy. https://www.uwo.ca/fhs/kin/undergrad/files/accommodation_request.pdf

3. **Grades:** Laboratory quizzes will be taken up in the subsequent laboratory. The midterm exam will be taken up in class. Should you have a concern regarding the grade you received for these assessments, or feel that it is unfair in any way, you must wait 24 hours from the receipt of the assignment to approach the instructor. In doing so, please make an appointment and prepare in writing, with evidence, why you feel your grade is inappropriate. Please be aware that in requesting a grade reassessment, your grade could go up/down/or stay the same. Note that calculations errors (which do occur!) should be brought to my attention immediately. 15% of course grades will be posted by the last day to drop a course.

A+	90-100	<i>One could scarcely expect better from a student at this level</i>
A	80-89	<i>Superior work that is clearly above average</i>
B	70-79	<i>Good work, meeting all requirements and eminently</i>
C	60-69	<i>Competent work, meeting requirements</i>
D	50-59	<i>Fair work, minimally acceptable.</i>
F	below 50	<i>Fail</i>

4. **Scholastic offences:** They are taken seriously and students are directed to read the appropriate policy, specifically, the definition of what constitutes a Scholastic Offence, at the following Web site:

http://www.uwo.ca/univsec/handbook/appeals/scholastic_discipline_undergrad.pdf.

A) Students must write their essays and assignments in their own words. Whenever students take an idea, or a passage from another author, they must acknowledge their debt

both by using quotation marks where appropriate and by proper referencing such as footnotes or citations. Plagiarism is a major academic offence (see Scholastic Offence Policy in the Western Academic Calendar). All required papers may be subject to submission for textual similarity review to the commercial plagiarism detection software under license to the University for the detection of plagiarism. All papers submitted for such checking will be included as source documents in the reference database for the purpose of detecting plagiarism of papers subsequently submitted to the system. Use of the service is subject to the licensing agreement, currently between Western University and Turnitin.com <http://www.turnitin.com>

B) Computer marked multiple-choice tests and/or exams may be subject to submission for similarity review by software that will check for unusual coincidences in answer patterns that may indicate cheating.

5. **Formatting:** Laboratory quizzes, midterm and final exams must be completed in a clear and legible manner. The small-group research project must be formatted according to the formatting guidelines within the submission guidelines for Western Undergraduate Research Journal of Health and Natural Sciences ([WURJ-HNS Submission guidelines](#)).

6. According to the **Examination Conflict policy**, Please see the Office of the Registrar policy on Exam Conflict and Multiple Exam Situations www.registrar.uwo.ca/examinations/exam_schedule.html

7. **Classroom Behaviour:** Class will begin promptly at the time specified at the top of page one of this syllabus. In the event that you must arrive late, please enter the classroom with a minimal disturbance to the class. Please keep all electronic devices on silent and avoid distracting classmates. .

During Exams: Unless you have medical accommodations that require you to do so, or explicit permission from the instructor of the course, you may not use any of the following electronic devices during ANY of the tests, quizzes, midterms, examinations, or other in-class evaluations: cellphones, smart phones, smart watches, smart glasses, audio players or recorders of any sort, video cameras, video games, DVD players, televisions, laptop/notebook/netbook computers, flashlights or laser pointers.

8. **Laptops** for the purpose of typing lecture **notes are permitted in class**, but please be respectful to your fellow students and turn the sound off. You are expected to use the computer for scholastic purposes only, and refrain from engaging in any activities that may distract other students from learning. From time to time, your professor may ask the class to turn off all computers, to facilitate learning or discussion of the material presented in a particular class. **Unless explicitly noted otherwise, you may not make audio or video recordings of lectures – nor may you edit, re-use, distribute, or re-broadcast any of the material posted to the course website.** If I receive complaints from other students regarding noise or other disruptive behavior laptop privileges will be revoked.

9. Regarding **illness:** please refer to the following document:
https://www.uwo.ca/univsec/pdf/academic_policies/appeals/accommodation_illness.pdf

The University recognizes that a student's ability to meet his/her academic responsibilities may, on occasion, be impaired by medical illness. Illness may be acute (short term), or it may be chronic (long term), or chronic with acute episodes. The University further recognizes that medical situations are deeply personal and respects the need for privacy and confidentiality in these matters. However, in order to ensure fairness and consistency for all students, academic accommodation for work representing 10% or more of the student's overall grade in the course shall be granted only in those cases where there is documentation indicating that the student

was seriously affected by illness and could not reasonably be expected to meet his/her academic responsibilities.

A UWO Student Medical Certificate (SMC) is required where a student is seeking academic accommodation. This documentation should be obtained at the time of the initial consultation with the physician or walk-in clinic. An SMC can be downloaded under the Medical Documentation heading of the following website:

http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf

Documentation is required for non-medical absences where the course work missed is more than 10% of the overall grade. Students may contact their Faculty Academic Counselling Office for what documentation is needed.

Whenever possible, students who require academic accommodation should provide notification and documentation in advance of due dates, examinations, etc. Students must follow up with their professors and their Academic Counselling office in a timely manner. Documentation for medical requests for accommodation must be submitted within two (2) business days after the end date on the documentation, to the appropriate Academic Counselling Office of the student's Faculty of registration. For KIN students, you may go to the School of Kinesiology in 3M Centre room 2225 NOT to the instructor. It will be the Academic Counselling office that will determine if accommodation is warranted.

10. **Health and Wellness:**

As part of a successful undergraduate experience at Western, we encourage you to make your health and wellness a priority. Western provides several on-campus health-related services to help you achieve optimum health and engage in healthy living while pursuing your degree. For example, to support physical activity, all students receive membership in Western's Campus Recreation Centre as part of their registration fees. Numerous cultural events are offered throughout the year. Please check out the Faculty of Music web page

(<http://www.music.uwo.ca/>), or the McIntosh Gallery <http://www.mcintoshgallery.ca/>

Further information regarding health and wellness-related services available to students may be found at <http://www.health.uwo.ca/>.

Students who are in emotional or mental distress should refer to Mental Health@Western (<http://www.uwo.ca/uwocom/mentalhealth/>) for a complete list of options about how to obtain help. To help you learn more about mental health, Western has developed an interactive mental health learning module, found here:

https://uwo.ca/health/mental_wellbeing/education/module.html.

STUDENT CODE OF CONDUCT

The purpose of the Code of Student Conduct is to define the general standard of conduct expected of students registered at Western University, provide examples of behaviour that constitutes a breach of this standard of conduct, provide examples of sanctions that may be imposed, and set out the disciplinary procedures that the University will follow. For more information, visit <https://www.uwo.ca/univsec/pdf/board/code.pdf>

ENGLISH PROFICIENCY FOR THE ASSIGNMENT OF GRADES

Visit the website http://www.uwo.ca/univsec/pdf/academic_policies/exam/english.pdf

SUPPORT SERVICES

There are various support services around campus and these include, but are not limited to:

1. *Student Development Centre* -- <http://www.sdc.uwo.ca/ssd/>
2. *Student Health* -- <http://www.shs.uwo.ca/student/studenthealthservices.html>
3. *Registrar's Office* -- <http://www.registrar.uwo.ca/>
4. *Ombudsperson Office* -- <http://www.uwo.ca/ombuds/>

Students who are in emotional/mental distress should refer to Mental Health@Western (<http://www.health.uwo.ca/>) for a complete list of options about how to obtain help.