

Western University
Faculty of Health Sciences
School of Kinesiology

**KIN 4520B - Clinical Biomechanics
Winter 2021**

<p>Instructor: Dr. Jim Dickey Office: Arts & Humanities Bldg Rm 3G01 Email: jdickey@uwo.ca Phone: 519/661-2111 x87834 Office Hrs: by appointment</p> <p>TAs: Pardis Baha pbaha2@uwo.ca Josh Cohen jcohen66@uwo.ca</p>	<p>Lectures: Asynchronous</p> <p>Instruction Mode: Online</p> <p>Labs</p> <table> <tr> <td>002/003</td> <td>Tu 4:30PM-6:30PM</td> </tr> <tr> <td>004/005</td> <td>We 12:30PM-2:30PM</td> </tr> <tr> <td>006/007</td> <td>We 2:30PM-4:30PM</td> </tr> </table>	002/003	Tu 4:30PM-6:30PM	004/005	We 12:30PM-2:30PM	006/007	We 2:30PM-4:30PM
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NOTE: All course information including grades, assignment outlines, deadlines, etc. are available via OWL. Check the website regularly for course announcements.

Calendar Course Description (including prerequisites/anti-requisites):

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.

Antirequisite(s): [Kinesiology 4450A/B](#), [Kinesiology 4475A/B](#).

Prerequisite(s): One of [Kinesiology 3341A/B](#), [Kinesiology 3343A/B](#) or [Kinesiology 3353A/B](#).

Extra Information: 3 lecture hours, 2 laboratory hours

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.

NOTE: If you wish to enroll in this course without the stated pre-requisite(s), you must obtain written approval from the course instructor. The approval should then be forwarded to your academic counsellor.

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 (in class, Date to be determined)	25%
5.	Final Exam	40%

Course Evaluation Details:

1. Labs will be announced in class and on OWL. The labs will be performed asynchronously, and involve analysis and interpretation of data, such as force plate data during standing balance, and kinematics and kinetics during gait. The laboratory evaluations are based on quizzes, within OWL, completed after the lab activities are complete.

The time slots for the labs will be used for other “face-to-face” encounters to support the course, such as assistance with the small-group research projects and “office hours”.

2. Small-Group research projects:

The scope of these projects is to replicate a published research study. These projects will involve secondary analysis of publicly available datasets, such as Dos Santos, D. A., C. A. Fukuchi, R. K. Fukuchi and M. Duarte (2017). "A data set with kinematic and ground reaction forces of human balance." *PeerJ* 5: e3626. The research questions will focus on issues related to standing balance as the background for these topics will be covered in class in the first part of the term. Projects will evaluate questions such as the effect of vision, effect of standing surface, relationship between scores on the Short Falls Efficacy Scale International and centre of pressure during standing, relationship between the centre of pressure and whole-body centre of mass during standing balance. The purpose of these projects is to provide a hands-on research experience working with real data. Students will pick groups of 4 or 5 members from the students in the same lab section. These groups must pick a research question, and a research study to replicate, that must be 1) based within Clinical Biomechanics, 2) must involve analyzing publicly available data. Each project must be pre-approved by Dr. Dickey.

The steps include picking a group and approval of the published research article, organizing and 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.

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 Zotero (<https://elearningtoolkit.uwo.ca/tools/Zotero.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, Holec 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 multiple choice, numeric response, 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 multiple choice, numeric response, short-answer questions and interpretations.

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Course/University Policies

1. Statement on Use of Personal Response Systems (“Clickers”)

If Personal Response Systems (“Clickers”) are used in the course, a reference to the Guidelines for their use (Guidelines are shown below). Instructors are to communicate clearly to students information on how clickers are used including: how the student’s privacy will be protected, how clickers may be used by the instructor for data gathering and for evaluating the students, and why they cannot be used by anyone but the student (since the students involved in misuse of a clicker may be charged with a scholastic offence).

2. **Academic 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: https://www.uwo.ca/univsec/pdf/academic_policies/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.

3. Electronic Device Usage:

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.

During Lectures and Tutorials: Although you are welcome to use a computer during lecture and tutorial periods, 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. Please be respectful to your fellow students and turn the sound off. If the professor receives complaints from other students regarding noise or other disruptive behavior (e.g. watching videos on YouTube.com, updating your Facebook status, playing Solitaire), your classroom privileges will be revoked. 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.**

4. Health and Wellness:

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

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.

5. 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 & Wellness -- <http://www.health.uwo.ca/>
3. Registrar's Office -- <http://www.registrar.uwo.ca/>
4. Ombudsperson Office -- <http://www.uwo.ca/ombuds/>

6. Documentation for Academic Accommodation (Illness, Medical/Non-Medical Absences):

http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_12

Students who experience an extenuating circumstance (illness, injury, or other extenuating circumstance) sufficiently significant to temporarily render them unable to meet academic requirements may submit a request for academic consideration through the following routes:

- (i) Submitting a Self-Reported Absence (see below for conditions)
- (ii) For medical absences exceeding 48 hours, submitting a Student Medical Certificate (SMC) signed by a licensed medical or mental health practitioner to their Academic Counselling in their Faculty of registration in order to be eligible for Academic Consideration; or
- (iii) For non-medical absences exceeding 48 hours, submitting appropriate documentation (e.g., obituary, police report, accident report, court order, etc.) to Academic Counselling in their Faculty of registration in order to be eligible for academic consideration. Students are encouraged to contact their Academic Counselling unit to clarify what documentation is appropriate.

Students seeking academic consideration **must communicate with their instructors no later than 24 hours** after the end of the period covered by either the self-reported absence or SMC, or immediately upon their return following a documented absence.

The following conditions are in place for self-reporting of medical or extenuating circumstances:

- a. a maximum of two self-reported absences between September and April and one self-reported absence between May and August;
 - b. any absences in excess of the number designated in clause a above will require students to present a Student Medical Certificate (SMC) or appropriate documentation supporting extenuating circumstances to the Academic Counselling unit in their Faculty of registration no later than two business days after the date specified for resuming responsibilities.
 - c. The duration of the excused absence will be for a maximum of 48 hours from the time the Self-Reported Absence form is completed through the online portal, or from 8:30 am the following morning if the form is submitted after 4:30 pm;
 - d. The duration of the excused absence will terminate prior to the end of the 48 hour period should the student undertake significant academic responsibilities (write a test, submit a paper) during that time;
 - e. The duration of an excused absence will terminate at 8:30 am on the day following the last day of classes each semester regardless of how many days of absence have elapsed;
 - f. Self-reported absences will not be allowed for scheduled final examinations; for midterm examinations scheduled during the December examination period; or for final lab examinations scheduled during the final week of term;
 - g. Self-reporting may not be used for assessments (e.g. midterm exams, tests, reports, presentations, or essays) worth more than 30% of any given course;
- For medical and non-medical absences that are not eligible for self-reporting Kinesiology students must submit an Academic Consideration Request form found online https://www.uwo.ca/fhs/kin/undergrad/files/accommodation_request.pdf in addition to an SMC or appropriate documentation in the event of a non-medical absence. 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.

7. **Grades:** Where possible assignment objectives and rubrics will be posted on OWL. Should you have a concern regarding the grade you received for an assignment or feel that it is unfair in any

way, you must wait 24 hours from the receipt of the assignment to approach the instructor or TA. 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.

Generally, students can expect some form of feedback on their performance in a course before the drop date.

- November 12th, 2020 (for first term half-courses)
- November 30th, 2020 (for full-year courses)
- March 14th, 2021 (for second term half courses)

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>

Rounding of Grades (for example, bumping a 79 to 80%):

This is a practice some students request. **This practice will not occur here.** The edges of this course are clear and sharp. The mark attained is the mark you achieved and the mark assigned; there is no rounding to the next grade level, or 'giving away' of marks. Please don't ask me to do this for you; the response will be "please review the course outline where this is presented".

8. **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.

9. **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>