Western University
Faculty of Health Sciences
School of Kinesiology

KIN 3353B – Biomechanical Analysis of Human Locomotion
Winter 2021

Instructor: Derek Pamukoff
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Office Hrs: WF 9:30-11am

TAs:

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Lectures: MWF 11:30am - 12:30pm

Instruction Mode: Online with in-person labs

Labs

002	Tuesday 8:30am-10:30am Arts & H 1R44
003	Tuesday 8:30am-10:30am
004	Tuesday 12:30pm-2:30pm Arts & H 1R44
005	Tuesday 12:30pm-2:30pm
006	Thursday 1:30pm- 3:30pm Arts & H 1R44
007	Thursday 1:30pm- 3:30pm
008	Thursday 3:30pm- 5:30pm Arts & H 1R44
009	Thursday 3:30pm- 5:30pm Arts & H 1R44
010	Thursday 8:30am- 10:30am Arts & H 1R44

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):
A laboratory-oriented, quantitative approach to the study of activities of a cyclic or repetitive nature by which individuals propel themselves over ground.

Anti-requisites KIN 3343A/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.

My Course Description
This course provides foundational skills in quantitative biomechanical analyses. Modules will expose students to basic elements of motion capture analyses. Lectures and applied laboratory experience will focus on kinematic and kinetic data analyses during linear and angular motions. Students will be exposed to basic data reduction, analysis and visualization methods. Finally, students will be exposed to biomechanical research and peer-reviewed literature.

Learning Outcomes/Schedule:
1. Students will be able to quantify human movement using appropriate biomechanical principles.
2. Students will be able to use motion analysis principles to characterize selected movement patterns in laboratory settings.
3. Students will participate in quantitative and qualitative analysis of selected movement forms for the purpose of improving analytic skills.
4. Students will develop the ability to read, understand and apply scientific methods of research toward biomechanical analyses, and in addition will be able to initiate research in the area of biomechanics.

Required Course Material/Text:
All materials will be posted on OWL. Students are expected to have moderate proficiency with Microsoft Excel and obtaining/reviewing scientific literature.

Course Evaluation Summary (Due Dates listed below):

1. Laboratory Assignments (4 @ 7.5%) 30%
    - Lab 1 Linear Kinematics due Feb 1
    - Lab 2 Angular Kinematics due Feb 22
    - Lab 3 Linear Kinetics due March 15
    - Lab 4 Angular Kinetics due March 29

*Attendance is required for submission of in-person lab assignments
**Assignments received late will not be graded

2. Midterm Exam 35%
    - Takehome Format (released Feb 24 and due Feb 26)
3. Final Exam 35%
    - Takehome Format (released for 48 hours during exam period: April 14-30)

Course Evaluation:
Assignments are due as stated in the course syllabus and will not be accepted late, except under medical or other compassionate circumstances. Submitting a late assignment without appropriate documentation will result in a zero (0) grade. A missed mid-term examination, without appropriate documentation will result in a zero (0) grade. Acceptable reasons might include hospital stays, serious illness, family emergencies (like serious accidents, illness or death) or similar circumstances.

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. **Accommodation, Illness Reporting and Academic Considerations**:
http://www.westerncalendar.uwo.ca/PolicyPages.cfm?Command=showCategory&PolicyCategoryID=1&SelectedCalendar=Live&ArchiveID=#Page_12

Accommodation Policies

Students with disabilities work with Accessible Education (formerly SSD) which provides recommendations for accommodation based on medical documentation or psychological and cognitive testing. The accommodation policy can be found here: Academic Accommodation for

Students with Disabilities.

Academic Consideration for Student Absence
https://www.uwo.ca/fhs/kin/undergrad/academic/consideration/index.html

Students will have up to two (2) opportunities during the regular academic year to use an on-line portal to self-report an absence during the term, provided the following conditions are met: the absence is no more than 48 hours in duration, and the assessment for which consideration is being sought is worth 30% or less of the student's final grade. Students are expected to contact their instructors within 24 hours of the end of the period of the self-reported absence, unless noted on the syllabus. Students are not able to use the self-reporting option in the following circumstances:

- for exams scheduled by the Office of the Registrar (e.g., December and April exams)
- absence of a duration greater than 48 hours,
- assessments worth more than 30% of the student's final grade,
- if a student has already used the self-reporting portal twice during the academic year

If the conditions for a Self-Reported Absence are *not* met, students will need to provide a Student Medical Certificate if the absence is medical, or provide appropriate documentation if there are compassionate grounds for the absence in question. Students are encouraged to contact their Faculty academic counselling office to obtain more information about the relevant documentation.

Students should also note that individual instructors are not permitted to receive documentation directly from a student, whether in support of an application for consideration on medical grounds, or for other reasons. **All documentation required for absences that are not covered by the Self-Reported Absence Policy must be submitted to the Academic Counselling office of a student's Home Faculty.**

For Western University policy on Consideration for Student Absence, see
Policy on Academic Consideration for Student Absences - Undergraduate Students in First Entry Programs
and for the Student Medical Certificate (SMC), see:
http://www.uwo.ca/univsec/pdf/academic_policies/appeals/medicalform.pdf.

Religious Accommodation
Students should consult the University's list of recognized religious holidays, and should give reasonable notice in writing, prior to the holiday, to the Instructor and an Academic Counsellor if their course requirements will be affected by a religious observance. Additional information is given in the Western Multicultural Calendar.

7. **Examination Conflicts**: A student with examinations having flexible submission times (e.g., where one or more examination is a take-home examination) cannot request alternative arrangements unless a conflict cannot be avoided by rescheduling writing the exam to a different time within the window specified by the instructor. This applies to direct conflicts as well as "heavy load" conflicts (e.g., three exams within a 23-hour period). The student should discuss any concerns about a potential conflict and/or request accommodation with their academic counselling unit prior to the deadline to drop a course without academic penalty

In the case of online examinations, an "Examination Conflict Room," which may be assigned when a student is scheduled to write two proctored exams concurrently, will be interpreted as arrangements for continuous proctoring.

8. **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 7th, 2021 (for second term half-or full year courses)

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

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".

9. **Contingency Plan for an In-Person Class Pivoting to 100% Online Learning:** In the event of a COVID-19 resurgence during the course that necessitates the course delivery moving away from face-to-face interaction, all remaining course content will be delivered entirely online, either synchronously (i.e., at the times indicated in the timetable) or asynchronously (e.g., posted on OWL for students to view at their convenience). The grading scheme will **not** change. Any remaining assessments will also be conducted online as determined by the course instructor

10. **Online Etiquette**: Some components of this course will involve online interactions. To ensure the best experience for both you and your classmates, please honour the following rules of etiquette:

- please "arrive" to class on time
- please use your computer and/or laptop if possible (as opposed to a cell phone or tablet)
- ensure that you are in a private location to protect the confidentiality of discussions in the event that a class discussion deals with sensitive or personal material
- to minimize background noise, kindly mute your microphone for the entire class until you are invited to speak, unless directed otherwise
- [suggested for classes larger than 30 students] In order to give us optimum bandwidth and web quality, please turn off your video camera for the entire class unless you are invited to speak
- [suggested for cases where video is used] please be prepared to turn your video camera off at the instructor's request if the internet connection becomes unstable
- unless invited by your instructor, do **not** share your screen in the meeting

The course instructor will act as moderator for the class and will deal with any questions from participants. To participate please consider the following:

- if you wish to speak, use the "raise hand" function and wait for the instructor to acknowledge you before beginning your comment or question
- remember to unmute your microphone and turn on your video camera before speaking
- self-identify when speaking.
- remember to mute your mic and turn off your video camera after speaking (unless directed otherwise)

General considerations of “netiquette”:

- Keep in mind the different cultural and linguistic backgrounds of the students in the course.
- Be courteous toward the instructor, your colleagues, and authors whose work you are discussing.
- Be respectful of the diversity of viewpoints that you will encounter in the class and in your readings. The exchange of diverse ideas and opinions is part of the scholarly environment. “Flaming” is never appropriate.
- Be professional and scholarly in all online postings. Cite the ideas of others appropriately.

Note that disruptive behaviour of any type during online classes, including inappropriate use of the chat function, is unacceptable. Students found guilty of Zoom-bombing a class or of other serious online offenses may be subject to disciplinary measures under the Code of Student Conduct.

11. **Online Learning Support**
If you require support with online learning tools and resources, please refer to the Faculty of Health Sciences Online Teaching and Learning Support Jira request links for students

12**. 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

NOTE the following important dates:

Winter 2021

Mon Jan 11/21:		Second term begins
Sat Feb 13 – Sun Feb 21/21		Reading Week NO CLASS
Mon Apr 12/21	:	Last Day of Class

Proposed Course Schedule

Week 1 (Jan 11) – Course Introduction, Motion Capture Theory, Math Review
Week 2 (Jan 18) – Linear Kinematics, Excel Basics
Week 3 (Jan 25) – Virtual Lab and Analyses (Sprinting); Discussion
Week 4 (Feb 1) – Angular Kinematics, Joint Angle Calculations
Week 5 (Feb 8) – Applications of Kinematic Analyses, Lab Data Analysis (Fri)
*In person lab – 2 Dimensional Walking Gait Analysis
Week 6 (Feb 15) – Reading Week NO CLASS
Week 7 (Feb 22) – Review and Midterm
Week 8 (March 1) – Forces and Linear Kinetics, GRF Calculations
Week 9 (March 8) – Application of Linear Kinetic Analyses, Lab Data Analysis (Fri)
*In person lab – Vertical Jump
Week 10 (March 15) – Torques and Angular Kinetics
Week 11 (March 22) – Virtual Lab and Analyses (Drop Landings); Discussion
Week 12 (March 29) – Applications of Angular Kinetic Analyses
Week 13 (April 5) – Special Topics and Review
Final Exam Period (April 14 – April 30)

Notes –

- Virtual lab instruction will take place during scheduled lecture time via zoom, but In-person lab experiences will take place during scheduled lab time sections;
- The order and dates of topics may change at the discretion of the instructor