

University of Texas at El Paso
Department of Kinesiology
KIN 5374 – Measurement Techniques in Biomechanics
Spring 2021

General Information

Instructor: Jeff Eggleston, Ph.D.
Office: HSSN 450; LKD 102C
Email: jdeggleston@utep.edu
Office Hours: By appointment only
Course Textbook: Research Methods in Biomechanics, Second Edition
D.G.E. Gordon, G.E. Caldwell, J. Hamill, G. Kamen, S.N. Whittlesey; Human Kinetics
Classroom: Your home
Virtual Office Hours: By appointment only

Course Description

This course will focus on techniques and instruments used in biomechanical research including data collection, analysis and written and visual presentation of information/data. Emphasis will be placed on developing an understanding of experimental techniques, capabilities, and limitations. Information presented will provide a historical and theoretical basis. In many instances, you will be referred to the literature to either support or refute a particular stance. Lecture content for this course will be administered in an asynchronous manner with assignment due at the end of each week. The exams will be administered in a pseudo-asynchronous manner with the midterm being completed at a specific date and time.

The following topics will be covered:

- Traditional biomechanical research methods; methodological considerations
- Scientific writing
- Signal processing
 - Signal smoothing
 - Signal filtering
 - Interpolation
- Kinematic instrumentation
 - Optical motion tracking
 - Accelerometry
- Kinetic instrumentation
 - Force platforms
 - Strain gauges
- Electromyography
- Isokinetic dynamometer
- Inertial Measurement Units

Additional Resources

Throughout the semester, additional assignments, readings, and information will be posted on Blackboard.

Learning Objectives

The objectives of this course are:

1. Possess working knowledge regarding equipment limitations, capacities, and appropriate usage;
2. Demonstrate knowledge relative to biomechanical research tools available;
3. Be able to process signals/data from a multitude of biomechanical research tools

Course Evaluation

Final Exam	20%
Midterm Exam	15%
Semester Project Proposal (Presentation and Write-up)	20%
Homework	20%
Equipment Presentation	15%
Participation	10%

Exams: There will be one mid-semester exam and one final exam for this course. Both exams will be 100 points each. The Final Exam will be cumulative; material from the entire semester can be on it. **The midterm exam will be conducted synchronously on March 23 between 5:30-8:30pm.** You must submit your exam to Blackboard by 8:30pm or you will receive a 10 point deduction. The Final exam will open on May 2 and will be due, via Blackboard, by May 7th at 5:00pm. Blackboard's SafeAssign software will be used to check for plagiarism. See further information regarding these policies below.

Semester Project Proposal: The semester project proposal will constitute you proposing a biomechanically-based research experiment on any topic. Your experiment will need to include an appropriate research question derived from literature and appropriate methods to answer the question. You are **required to include at least two (2) pieces of equipment** that were covered in the semester to answer your question. There are two components to this project: a written document and a presentation. The written portion of your project will be submitted to Blackboard, similar to all assignments. There is no page limit, it simply needs to be done well without superfluous information. The semester project accounts for the largest percentage of the course grade, be sure to follow the detailed description below closely. The presentation will be conducted asynchronously through a Blackboard discussion board post. Specifically, you need to voice over a PowerPoint presentation and record the presentation in a .mp4 format and shared with my by April 28st. After receiving all presentations, I will post them to separate Blackboard discussion boards for classmates to view. Upon viewing each presentation, students must post at least 1 question to each presentation (except your own) within the week of May 2nd. The presentation is worth 100 points and written draft is worth 120 points.

Your proposal must include each of the sections and sub-sections below. For the Expected Results section, this should come from the literature and be in support of your hypothesis. Expected results should not come from your thoughts. Your written document will also be graded on **Writing Quality** and **References/Reference Formatting**, worth 10 points each (120 total points).

- 1) Introduction (15 points)
 - a. Development of a research question from relevant literature
 - b. Purpose and hypothesis
- 2) Methods
 - a. Participants (10 points)
 - b. Experimental procedures (30 points)
 - c. Data reduction (20 points)
 - d. Statistical analysis (5 points)
- 3) Expected Results (10 points)
- 4) Impact (10 points)

Equipment Presentation: You will be required to present, as a group, on the technical aspects of a piece of equipment. The information in your presentation needs to be detailed and provide more than basic information about its function. Furthermore, if there are varying types of equipment (*i.e.* strain gauge vs. piezoelectric force platforms) you need to speak in detail about each and discuss the pros and cons of each. You are not expected to have expert-level knowledge, but you should demonstrate working-level knowledge of the equipment. Since this course is completely virtual, equipment presentations will occur similar to the semester project

presentations. Equipment presentations need to be shared with the instructor by April 21st in .mp4 files. Once received, they will be posted to Blackboard discussion boards for others to post questions on.

In-class Projects/Activities: Homework/projects will be assigned throughout the semester which could include mathematical problems, scenarios to invoke critical thinking, discussion questions, movement analyses, and research or reading tasks. These activities will be aligned with the course progression, so stay current with course topics and material.

Participation: To earn participation credit in this course, you must post a question to each person/group's semester and equipment presentations. If you do not comment on one of the presentations, you will only receive half credit for this allocation.

Grading Policy

A	≥ 90.0%
B	80.0%-89.9%
C	70.0%-79.9%
D	60.0%-69.9%
F	<59.9%

Grades will not be rounded

Course Communication

Office Hours

We will not be able to meet on campus, but I will still have office hours for your questions and comments about the course. My office hours will be on zoom and are by appointment only. Please do not hesitate to reach out with any questions, issues, or concerns you have with the course.

Email

UTEP email is the best way to contact me. I will make every attempt to respond to your emails within 24-48hours during the workweek. Please ensure you email me from your UTEP email student account

Announcements

Throughout the semester I will post announcements with any updates on the course. With COVID, things will likely be very fluid, so please keep an eye out for announcements. I will always send emails with each announcement

Discussion Board

Several instances throughout the semester you will communicate with your fellow students via Blackboard discussion boards. Please ensure you follow the discussion board threads when appropriate

Attendance Policy

Attendance will not be taken since this is an asynchronous course.

Netiquette

As we know, sometimes communication online can be challenging. It's possible to miscommunicate what we mean or to misunderstand what our classmates mean given the lack of body language and immediate feedback. Therefore, please keep these netiquette (network etiquette) guidelines in mind. Failure to observe them may result in disciplinary action.

- Always consider audience. This is a college-level course; therefore, all communication should reflect polite consideration of others' ideas

- Respect and courtesy must be provided to classmates and to the instructor at all times. No harassment or inappropriate postings will be tolerated
- When reacting to someone else's message, address the ideas, not the person. Post only what anyone would comfortably state in a face-to-face situation
- Blackboard is not a public internet venue; all postings to it should be considered private and confidential. Whatever is posted on in these online spaces is intended for classmates and professor only. Please do not copy documents

Excused Absences and/or Course Drop Policy

I will not drop you from the course. However, if you feel that you are unable to complete the course successfully, please let me know and then contact the Registrar's Office to initiate the drop process. If you do not, you are at risk of receiving an "F" for the course.

Alternative Means of Submitting Work in Case of Technical Issues

I strongly suggest that you submit your work with plenty of time to spare in the event that you have a technical issue with the course website, network, and/or your computer. I also suggest you save all your work (answers to discussion points, quizzes, exams, and essays) in a separate Word document as a back-up. This way, you will have evidence that you completed the work and will not lose credit. If you are experiencing difficulties submitting your work through the course website, please contact the UTEP Help Desk. You can email me your back-up document as a last resort.

COVID-19 Accommodations

Students are not permitted on campus when they have a positive COVID-19 test, exposure or symptoms. If you are not permitted on campus, you should contact me as soon as possible so we can arrange necessary and appropriate accommodations.

Scholastic Integrity

Academic dishonesty is prohibited and is considered a violation of the UTEP Handbook of Operating Procedures. It includes, but is not limited to, cheating, plagiarism, and collusion. Cheating may involve copying from or providing information to another student, possessing unauthorized materials during a test, or falsifying research data on laboratory reports. Plagiarism occurs when someone intentionally or knowingly represents the words or ideas of another as ones' own. Collusion involves collaborating with another person to commit any academically dishonest act. Any act of academic dishonesty attempted by a UTEP student is unacceptable and will not be tolerated. All suspected violations of academic integrity at The University of Texas at El Paso must be reported to the Office of Student Conduct and Conflict Resolution (OSCCR) for possible disciplinary action. To learn more, visit the HOOP Student Conduct and Discipline.

Plagiarism Detecting Software

Some of your course work and assessments may submitted to SafeAssign, a plagiarism detecting software. SafeAssign is used review assignment submissions for originality and will help you learn how to properly attribute sources rather than paraphrase

Copyright Statement for Course Materials

All materials used in this course are protected by copyright law. The course materials are only for the use of students currently enrolled in this course and only for the purpose of this course. They may not be further disseminated

COVID-19 Precautions

You must STAY AT HOME and REPORT if you (1) have been diagnosed with COVID-19, (2) are experiencing COVID-19 symptoms, or (3) have had recent contact with a person who has received a positive coronavirus test. Reports should be made at screening.utep.edu. If you know of anyone who should report any

of these three criteria, you should encourage them to report. If the individual cannot report, you can report on their behalf by sending an email to COVIDaction@utep.edu.

For each day that you attend campus—for any reason—you must complete the questions on the UTEP screening website (screening.utep.edu) prior to arriving on campus. The website will verify if you are permitted to come to campus. Under no circumstances should anyone come to class when feeling ill or exhibiting any of the known COVID-19 symptoms. If you are feeling unwell, please let me know as soon as possible, and alternative instruction will be provided. Students are advised to minimize the number of encounters with others to avoid infection.

Wear face coverings when in common areas of campus or when others are present. You must wear a face covering over your nose and mouth at all times in this class. If you choose not to wear a face covering, you may not enter the classroom. If you remove your face covering, you will be asked to put it on or leave the classroom. Students who refuse to wear a face covering and follow preventive COVID-19 guidelines will be dismissed from the class and will be subject to disciplinary action according to Section 1.2.3 *Health and Safety* and Section 1.2.2.5 *Disruptions* in the UTEP Handbook of Operating Procedures.

No phones will be allowed as calculators, and calculators must not have any additional capabilities. All exams and quizzes will be written as such and will only require basic algebraic and trigonometric functions.

Course Content

See the class schedule for approximate dates for each covered topic.

Exam Schedule

Midterm Exam March 23rd
Final Exam **Due May 7th by 5:00pm**

*both exams must be submitted to Blackboard

University Policies and Resources

Changes to this syllabus – The course schedule may be altered by the instructor, with sufficient notice being provided to students.

Cheating, Plagiarism, Scholastic Dishonesty, and Student Discipline: Cheating is obtaining a reward for ability by dishonest means. It is unethical and not acceptable. Plagiarism occurs whenever a student quotes, paraphrases or summarizes another person's work without providing correct citation. Plagiarism occurs whether the work quoted is a book, article, website, reader's guide like Cliffs Notes or SparkNotes, another student's paper, or any other source. An entire essay is fraudulent even if only a single sentence is plagiarized. *Do not submit work under your name that you did not do yourself, ever.* You may not submit work for this class that you did for another class. If you cheated or plagiarized, you will be subject to disciplinary action as stated in the UTEP catalog policy.

“Scholastic dishonesty (which includes the attempt of any student to present the work of another as his or her own, or any work which s(he) has not honestly performed, or attempting to pass any examination by improper means) is a serious offense and will subject the student to disciplinary action. The aiding and abetting of a student in any dishonesty is held to be an equally serious offense. All alleged acts of scholastic dishonesty should be reported to the Dean of Students for disposition. It is the Dean of Students’ responsibility to investigate each allegation, dismiss the allegation, or proceed with disciplinary action in a manner which provides the accused student his or her rights of due process.” Refer to <http://www.utep.edu/dos/acadintg.htm> for further information.

When an assignment specifies that you must perform a task individually, asking for your classmates’ help is **collusion** and thus scholastic dishonesty. Any instances of scholastic dishonesty will be reported to the Dean of Students Office.

Deadline Policy and Late Assignments: It is essential that you regularly visit the class Blackboard website prepared to work. Once a deadline has passed, you can no longer turn in your work for credit. Plan carefully to ensure you meet the deadlines. If you wait until the last minute, things that can go wrong often do. Start early so you have time to deal with problems and are still able turn in your assignments on time. Do not procrastinate!

Missed Tests: All assignments will strictly follow UTEP's attendance policy. Any missed assignment that does not meet the requirements of an excused absence will be counted as a 0. If you are going to / or miss an assignment and you believe the absence is excusable, you must contact the Professor within 24 hours of the assignments due date. Emailing later in the semester about missing grades, even if the absence was excused, will not be accepted. It is the student's responsibility to keep track of when assignments are due and also communicating to the Professor when absences happen.

Students in Need of Assistance: UTEP seeks to provide reasonable accommodations for all qualified individuals who need accommodations or support for their learning. This university adheres to all applicable federal, state, and local laws, regulations and guidelines with respect to providing reasonable accommodations as required, affording equal educational opportunity. It is the *student's responsibility* to register with the **Center for Accommodations and**

Support Services <http://sa.utep.edu/cass/> in the UTEP Union Bldg. East Wing, Room 106 *within the first two weeks of classes*, and inform the faculty member to arrange for appropriate accommodations or support.

The CASS Office can also be reached in the following ways: Web: <http://cass.utep.edu/>; Phone: (915) 747-5148 voice or TTY; Fax: (915) 747-8712; E-Mail: cass@utep.edu

Campus Safety and Emergencies Notifications: Information Technology at UTEP provides emergency notification via your mobile phone. Visit <http://www.utep.edu/it> for more information and registration. Check the UTEP website for health-related information and updates.