DEPARTMENT OF HEALTH AND HUMAN PERFORMANCE
HHPK 593 - Biomechanics
Spring 2025 – NHS 165 (Lab)

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Office Hours: **M,W-F 12pm – 1pm, T – 12:30pm – 1:30pm**
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REQUIRED TEXT: Gordon, R. D. (2013), 2nd Edition. *Research Methods in Biomechanics*. ISBN: 9781492576334, Human Kinetics.

Course Description:

Biomechanics operates as an interdisciplinary science, using knowledge of physics, anatomy, physiology, strength and conditioning, rehabilitative sciences, and mathematics. The course is designed to use real world data, in a project format, to investigate methods of data analysis, data transformation, and statistical analysis.

Student Learning Outcomes:

By the end of the course, the successful student should be able to**:**
1) Use planar and three-dimensional terminology to kinematic motion.
2) Use body segment parameters, forces, energy, work, and power to relate 2D and 3D motions
3) Understand how mathematical modeling and muscle activity studies interact
4) Utilize data and signal processing to investigate complex movement patterns
5) Present biomechanical data and transformative statistical analysis

Course Requirements:

Group/ Homework Activities

The student will participate in several class, group, and homework activities throughout the semester. Some will be graded, and some will not. Student participation will be averaged into this category. Group work / homework will count for **10% of the final grade (100 points)**.

Tests:

Students will take 2 tests throughout the semester worth 250 points each. Tests will cover lectures, class activities, and the textbook.
(500 points, 50% of final grade)

DARI Motion Analysis Project:

Student groups will complete mass data collection on common movement patterns and performance measures using DARI Motion equipment and software. Many more details will be given regarding this assignment in a completely separate handout. **(400 points, 40% of your grade)**

Course Grading:

1. Group work, homework	100 points	10%
2. Tests (2) Midterm and Final	500 points	50%
4. DARI Motion Analysis Project	400 points	40%
Total:	**1000 points**	**100%**

Grading Scale:

100 – 90%	**A**
89 – 80%	**B**
79 – 70%	**C**
69 – 60%	**D**
59 – 0%	**F**

Minimal Technical Skills Needed

Using the learning management system, using Microsoft Word, PowerPoint, and Excel, using university email, and using Google Docs / Slides.

TECHNOLOGY REQUIREMENTS

Browser support

D2L is committed to performing key application testing when new browser versions are released. New and updated functionality is also tested against the latest version of supported browsers. However, due to the frequency of some browser releases, D2L cannot guarantee that each browser version will perform as expected. If you encounter any issues with any of the browser versions listed in the tables below, contact D2L Support, who will determine the best course of action for resolution. Reported issues are prioritized by supported browsers and then maintenance browsers.

Supported browsers are the latest or most recent browser versions that are tested against new versions of D2L products. Customers can report problems and receive support for issues. For an optimal experience, D2L recommends using supported browsers with D2L products.

Maintenance browsers are older browser versions that are not tested extensively against new versions of D2L products. Customers can still report problems and receive support for critical issues; however, D2L does not guarantee all issues will be addressed. A maintenance browser becomes officially unsupported after one year.

Note the following:

- Ensure that your browser has JavaScript and Cookies enabled.
- For desktop systems, you must have Adobe Flash Player 10.1 or greater.
- The Brightspace Support features are now optimized for production environments when using the Google Chrome browser, Apple Safari browser, Microsoft Edge browser, Microsoft Internet Explorer browser, and Mozilla Firefox browsers.

Desktop Support

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Edge	Latest	N/A

Browser	Supported Browser Version(s)	Maintenance Browser Version(s)
Microsoft® Internet Explorer®	N/A	11
Mozilla® Firefox®	Latest, ESR	N/A
Google® Chrome™	Latest	N/A
Apple® Safari®	Latest	N/A

Tablet and Mobile Support

Device	Operating System	Browser	Supported Browser Version(s)
Android™	Android 4.4+	Chrome	Latest
Apple	iOS®	Safari, Chrome	The current major version of iOS (the latest minor or **point** release of that major version) and the previous major version of iOS (the latest minor or **point** release of that major version). For example, as of June 7, 2017, D2Lsupports iOS 10.3.2 and iOS 9.3.5, but not iOS 10.2.1, 9.0.2, or any other version. Chrome: Latest version for the iOS browser.
Windows	Windows 10	Edge, Chrome, Firefox	Latest of all browsers, and Firefox ESR.

- You will need regular access to a computer with a broadband Internet connection. The minimum computer requirements are:
    - 512 MB of RAM, 1 GB or more preferred
    - Broadband connection required courses are heavily video intensive
    - Video display capable of high-color 16-bit display 1024 x 768 or higher resolution

- You must have a:
    - Sound card, which is usually integrated into your desktop or laptop computer
    - Speakers or headphones.
    - *For courses utilizing video-conferencing tools and/or an online proctoring solution, a webcam and microphone are required.

- Both versions of Java (32 bit and 64 bit) must be installed and up to date on your machine. At a minimum Java 7, update 51, is required to support the learning management system. The most current version of Java can be downloaded at: JAVA web site http://www.java.com/en/download/manual.jsp

- Current anti-virus software must be installed and kept up to date.

Running the browser check will ensure your internet browser is supported.

Pop-ups are allowed.
JavaScript is enabled.
Cookies are enabled.

- You will need some additional free software (plug-ins) for enhanced web browsing. Ensure that you download the free versions of the following software:
  - Adobe Reader https://get.adobe.com/reader/
  - Adobe Flash Player *(version 17 or later)* https://get.adobe.com/flashplayer/
  - Adobe Shockwave Player https://get.adobe.com/shockwave/
  - Apple Quick Time http://www.apple.com/quicktime/download/

- At a minimum, you must have Microsoft Office 2013, 2010, 2007 or Open Office. Microsoft Office is the standard office productivity software utilized by faculty, students, and staff. Microsoft Word is the standard word processing software, Microsoft Excel is the standard spreadsheet software, and Microsoft PowerPoint is the standard presentation software. Copying and pasting, along with attaching/uploading documents for assignment submission, will also be required. If you do not have Microsoft Office, you can check with the bookstore to see if they have any student copies.

ACCESS AND NAVIGATION

You will need your campus-wide ID (CWID) and password to log into the course. If you do not know your CWID or have forgotten your password, contact the Center for IT Excellence (CITE) at 903.468.6000 or helpdesk@tamuc.edu**.**

Note: Personal computer and internet connection problems do not excuse the requirement to complete all course work in a timely and satisfactory manner. Each student needs to have a backup method to deal with these inevitable problems. These methods might include the availability of a backup PC at home or work, the temporary use of a computer at a friend's home, the local library, office service companies, Starbucks, a TAMUC campus open computer lab, etc.

COMMUNICATION AND SUPPORT

Brightspace Support

Need Help?

Student Support

If you have any questions or are having difficulties with the course material, please contact your Instructor.

Technical Support

If you are having technical difficulty with any part of Brightspace, please contact Brightspace Technical Support at 1-877-325-7778 or click on the **Live Chat** or click on the words "click here" to submit an issue via email.

System Maintenance

Please note that on the 4th Sunday of each month there will be System Maintenance which means the system will not be available 12 pm-6 am CST.

Interaction with Instructor Statement

My response time to emails may be as long as 48 hours. Please be patient. Grades for assignments may be posted no later than 1 week after the submission deadline.

Syllabus Change Policy

The syllabus is a guide. Circumstances and events, such as student progress, may make it necessary for the instructor to modify the syllabus during the semester. Any changes made to the syllabus will be announced in advance.

COURSE POLICIES

A. **LATE ASSIGNMENTS**: **Late assignments will NOT be accepted**. All assignments are due at the beginning of class on the date they are due. If you know that you will not be able to attend class on a day that an assignment is due, please let me know and make plans to turn in the assignment before the due date. All assignments turned in after the due date will be considered late.

B. CLASS ATTENDANCE: Attendance to these sessions in not mandatory, BUT HIGHLY ADVISED. This class is exceptionally difficult to try and navigate on your own. Questions will be directed to the class and individuals. BE PREPARED TO ANSWER.

C. Any student *missing an exam or assignment* without prior arrangement will receive a *score of zero*.

D. You MUST check your e-mail regularly in case I need to communicate with you. I will not e-mail you junk, and I request that you do the same for me. You may only use your university email. No private email addresses will be included in the group message system.

University Specific Procedures

Student Conduct

All students enrolled at the University shall follow the tenets of common decency and acceptable behavior conducive to a positive learning environment. The Code of Student Conduct is described in detail in the Student Guidebook.
http://www.tamuc.edu/Admissions/oneStopShop/undergraduateAdmissions/studentGuidebook.aspx

Students should also consult the Rules of Netiquette for more information regarding how to interact with students in an online forum: Netiquette
http://www.albion.com/netiquette/corerules.html

TAMUC Attendance

For more information about the attendance policy please visit the Attendance webpage and Procedure 13.99.99.R0.01.
http://www.tamuc.edu/admissions/registrar/generalInformation/attendance.aspx
http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/academic/13.99.99.R0.01.pdf

Academic Integrity

Students at Texas A&M University-Commerce are expected to maintain high standards of integrity and honesty in all of their scholastic work. For more details and the definition of academic dishonesty see the following procedures:

Undergraduate Academic Dishonesty 13.99.99.R0.03

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/undergraduates/13.99.99.R0.03UndergraduateAcademicDishonesty.pdf

Graduate Student Academic Dishonesty 13.99.99.R0.10

http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/13students/graduate/13.99.99.R0.10GraduateStudentAcademicDishonesty.pdf

PLAGIARISM/ACADEMIC DISHONESTY: Texas A&M University-Commerce does not tolerate **plagiarism** and other forms of academic **dishonesty**. Conduct that violates generally accepted standards of academic honesty is defined as academic dishonesty. "Academic dishonesty" includes, but is not limited to, plagiarism (the appropriation or stealing of the ideas or words of another and passing them off as one's own), cheating on exams or other course assignments, collusion (the unauthorized collaboration with others in preparing course assignments), and abuse (destruction, defacing, or removal) of resource material. Be aware that the intent to deceive the reader does not have to be present for plagiarism to occur. For more information, please go to http://www.plagiarism.org/.
If you are in any doubt as to whether your work constitutes plagiarism or academic dishonesty, please discuss this with me confidentially.

STUDENTS WITH DISABILITIES: The Americans with Disabilities Act (ADA) is a federal anti-discrimination statute that provides comprehensive civil rights protection for persons with disabilities. Among other things, the legislation requires that all students with disabilities be guaranteed a learning environment that provides for reasonable accommodation of their disabilities. If you have a disability requiring an accommodation, please contact:

Office of Student Disability Resources and Services
Texas A&M University-Commerce
Gee Library, Room 132
Phone (903) 886-5150 or (903) 886-5835
Fax: (903) 468-8148
StudentDisabilityServices@tamuc.edu

Nondiscrimination Notice

Texas A&M University-Commerce will comply in the classroom, and in online courses, with all federal and state laws prohibiting discrimination and related retaliation on the basis of race, color, religion, sex, national origin, disability, age, genetic information or veteran status. Further,

an environment free from discrimination on the basis of sexual orientation, gender identity, or gender expression will be maintained.

Campus Concealed Carry

Texas Senate Bill - 11 (Government Code 411.2031, et al.) authorizes the carrying of a concealed handgun in Texas A&M University-Commerce buildings only by persons who have been issued and are in possession of a Texas License to Carry a Handgun. Qualified law enforcement officers or those who are otherwise authorized to carry a concealed handgun in the State of Texas are also permitted to do so. Pursuant to Penal Code (PC) 46.035 and A&M-Commerce Rule 34.06.02.R1, license holders may not carry a concealed handgun in restricted locations. For a list of locations, please refer to ((http://www.tamuc.edu/aboutUs/policiesProceduresStandardsStatements/rulesProcedures/34SafetyOfEmployeesAndStudents/34.06.02.R1.pdf) and/or consult your event organizer). Pursuant to PC 46.035, the open carrying of handguns is prohibited on all A&M-Commerce campuses. Report violations to the University Police Department at 903-886-5868 or 9-1-1.

The Counseling Center at A&M-Commerce, located in the Halladay Building, Room 203, offers counseling services, educational programming, and connection to community resources for students. Students have 24/7 access to the Counseling Center's crisis assessment services by calling 903-886-5145. For more information regarding Counseling Center events and confidential services, please visit www.tamuc.edu/counsel

AI Use in Courses

Texas A&M University-Commerce acknowledges that there are legitimate uses of Artificial Intelligence, Chatbots, or other software that has the capacity to generate text, or suggest replacements for text beyond individual words, as determined by the instructor of the course.
Any use of such software must be documented. Any undocumented use of such software constitutes an instance of academic dishonesty (plagiarism).
Individual instructors may disallow entirely the use of such software for individual assignments or for the entire course. Students should be aware of such requirements and follow their instructors' guidelines. If no instructions are provided the student should assume that the use of such software is disallowed.
In any case, students are fully responsible for the content of any assignment they submit, regardless of whether they used an AI, in any way. This specifically includes cases in which the AI plagiarized another text or misrepresented sources.

13.99.99.R0.03 Undergraduate Academic Dishonesty
13.99.99.R0.10 Graduate Student Academic Dishonesty

HHPK 593: Biomechanics
Spring Semester 2025

Tentative Itinerary (75%-does not include labs)

Week	Chapters	Topics and Page Numbers	Assignments Due
1	Intro (pgs 14-18)	Biomechanical Analysis Techniques – A Primer Excel – Analysis Techniques	
2		DARI Motion – Project Introduction Data Collection – Class Data Report Generation Techniques	
3	1	Planar Kinematics	
4	2	Three-Dimensional Kinematics	
5	3	Body Segment Parameters	
6	4	Forces and Their Measurement	
7	5	Two-Dimensional Inverse Dynamics	
8		Project Checkpoint	
3/4/2022		**Mid-Term Exam** **Ch. 1 - 5**	**Mid-Term Exam**
3/10 – 3/14		**Spring Break!!!**	**No Class**
9	6	Energy, Work, and Power	
10	7	Three-Dimensional Kinetics	
11	8	Electromyographic Kinesiology	
12	10	Computer Simulation of Human Movement	
13	11	Musculoskeletal Modeling	
14		Presentations of Project	Presentations
15		Presentations of Project	Presentations
Tuesday, May 6th		**Final Exam – 5/6/25**	**Final Exam**