San José State University
College of Health and Human Sciences
Department of Kinesiology
KIN 158, Biomechanics, Section 1, Spring 2022

Course and Contact Information

Instructor(s):	Lecture and Lab: Li Jin, PhD Lab: Adriane Cris Tomimbang, MA
Email:	li.jin@sjsu.edu adrianecris.tomimbang@sjsu.edu
Office Location:	Spartan Complex Central 111
Online Office Hours:	Monday 10:30am – 12:30pm (Online Office Hours Zoom link: https://sjsu.zoom.us/j/86466510803) Send email to reserve an appointment time
Class Days/Time:	Lecture twice a week: (synchronous + asynchronous online manner before Feb 14) Tuesday and Thursday 8:00am – 8:50am Lab once a week: (asynchronous online manner before Feb 14) Tuesday 10:00am – 11:50am, or 12:00pm – 1:50pm, or 2:00pm – 3:50pm or Thursday 10:00am – 11:50am, or 12:00pm – 1:50pm, or 2:00pm – 3:50pm.
Classroom:	Lecture: Yoshihiro Uchida Hall 124 Lecture Zoom link: https://sjsu.zoom.us/j/88938856857. Lab: Spartan Complex Central, Room 234, Biomechanics Lab.
Prerequisites:	KIN 070 (min C-); BIOL 065 (min C-); Math Area B4 (min C-)

Course Description

Biomechanics is the science concerned with the relationship of structural and mechanical principles of the musculoskeletal system to the analysis of human performance. Rigid-body mechanics will be used to explain gross movement of humans. Within rigid-body mechanics, dynamics, or the mechanics of objects in accelerated motion will be explored. Both kinematics and kinetics will be studied. This course will consist of lectures and activity labs designed to apply the knowledge of biomechanics to activities such as exercise, sports and locomotion.

Course Format

Technology Intensive Hybrid Course

This course will be facilitated in the hybrid format. Specifically, the lectures will be conducted in a synchronous and asynchronous combined manner before Feb 14, 2022: all lectures will be video streamed live via Zoom meeting at the regularly assigned time and they will be recorded simultaneously, and the lectures Zoom videos will be available in Canvas for students to review course materials. After Feb 14, 2022, lecture will go back to the synchronous in-person format. Lab sections will be conducted in an asynchronous manner before Feb 14, 2022: lab instruction videos will be available in Canvas and students should work remotely with their group members to finish each lab assignment. After Feb 14, 2022, lab sections will be conducted in a synchronous in-person manner. Students should come to lab to work with their group members to finish each lab assignment.

The correspondence with the instructor will take place via lab section Q&A, email or Online Zoom Office Hours. Students should install Zoom software in your computer and the detail information is here: https://www.sjsu.edu/ecampus/software-tools/teaching-tools/video-creative/zoom/index.php. It is important for students to have reliable internet access when attempting to interact with the instructor via email or Online Zoom Office Hours. See University Policy F13-2 at http://www.sjsu.edu/senate/docs/F13-2.pdf for more details.

Recording Zoom Classes

This course or portions of this course (i.e., lectures, discussions, student presentations) will be recorded for instructional or educational purposes. The recordings will only be shared with students enrolled in the class through Canvas. The recordings will be deleted at the end of the semester. If, however, you would prefer to remain anonymous during these recordings, then please speak with the instructor about possible accommodations (e.g., temporarily turning off identifying information from the Zoom session, including student name and picture, prior to recording).

Students are not allowed to record without instructor permission
Students are prohibited from recording class activities (including class lectures, office hours, advising sessions, etc.), distributing class recordings, or posting class recordings. Materials created by the instructor for the course (syllabi, lectures and lecture notes, presentations, etc.) are copyrighted by the instructor. This university policy (S12-7) is in place to protect the privacy of students in the course, as well as to maintain academic integrity through reducing the instances of cheating. Students who record, distribute, or post these materials will be referred to the Student Conduct and Ethical Development office. Unauthorized recording may violate university and state law. It is the responsibility of students that require special accommodations or assistive technology due to a disability to notify the instructor.

MYSJSU Messaging

Course materials such as syllabus, handouts, notes, assignment instructions, etc. can be found in Canvas Learning Management System course login website at http://sjsu.instructure.com. You are responsible for regularly checking your SJSU email and Canvas through MySJSU on Spartan App Portal http://one.sjsu.edu to learn of any updates. For help with using Canvas see Canvas Student Resources page (https://www.sjsu.edu/ecampus/software-tools/teaching-tools/canvas/student-resources/index.php).

Kinesiology Undergraduate Degree Program Learning Objectives (PLO)

Upon completion of a Bachelor of Science degree program in the Department of Kinesiology, students will be able to:

1. Explain, identify, and/or demonstrate the theoretical and/or scientific principles that can be used to address issues or problems in the sub-disciplines in kinesiology.
2. Effectively communicate in writing (clear, concise and coherent) on topics in kinesiology.
3. Effectively communicate through an oral presentation (clear, concise and coherent) on topics in kinesiology.
4. Utilize their experiences across a variety of health related and skill-based activities to inform their scholarship and practice in the sub disciplines in kinesiology.
5. Identify and analyze social justice and equity issues related to kinesiology for diverse populations.

Course Goals

The students will understand and will successfully apply basic biomechanical principles to the analysis of human movement.

Course Learning Outcomes (CLO)

Upon successful completion of this course, students will be able to:

1. Use precise, well-defined professional biomechanical and anatomical terminology to describe motion (PLO #1 and #2).
2. Quantify linear and angular descriptors of human motion (PLO #1).
3. Quantify the forces, torques, mechanical work and power associated with human movement (PLO #1).
4. Use Newton's Laws to study forces and torques applied to the human body and identify movement mechanics (PLO #1).
5. Demonstrate the ability to accurately calculate and analyze kinematic and kinetic variables related to human movement in different sports and physical activities (PLO #1 and #4).
6. Explain human movement in various sports and physical activities through an understanding of biomechanical principles and identify the strategies to improve human movement performance (PLO #1 and #4).
7. Identify human movement injury mechanisms and explain age, gender, cultural and other individual differences may exist in biomechanical responses in various sports and physical activities (PLO #1 and #5).

Required Texts/Readings

Textbook

Biomechanics: A Case Based Approach, Flanagan S (2019), 2nd edition. Burlington MA, Jones and Bartlett Learning (ISBN: 9781284102338).

Other Readings

Biomechanics of Sport and Exercise, Peter M. McGinnis (2013), 3rd edition. Champaign IL, Human Kinetics (ISBN: 9780736079662).

Other technology requirements / equipment / material

For successful completion of this course, an electronic device (laptop, desktop or tablet) and a simple non-programmable calculator are recommended. Additionally, part of the lectures and the Online Office Hours will be conducted via Zoom. Students should install Zoom software in your computer and the detail information is here: https://www.sjsu.edu/ecampus/software-tools/teaching-tools/video-creative/zoom/index.php. This course will make extensive use of Canvas Learning Management System at http://sjsu.instructure.com. Course materials, homework and lab assignments will be posted in Canvas regularly. Please check often for class updates.

Students are responsible for ensuring that they have access to reliable Wi-Fi during the homework quizzes and exams. If students are unable to have reliable Wi-Fi, they must inform the instructor, as soon as possible or at the latest one week before the test date to determine an alternative. See Learn Anywhere website for current Wi-Fi options on campus.

Library Liaison

Kinesiology
Adriana Poo

Phone: (408) 808-2019
Email: adriana.poo@sjsu.edu

Course Requirements and Assignments

1. Attendance and participation in all lectures and labs
2. Five homework assignments in Canvas
3. Eleven lab activity assignments
4. Three exams

Components of Final Grade

1. Homework Assignments (25% of final grade):
   There will be 5 homework assignments in this course. They will be based on course content and will be available in Canvas as specified on the class schedule. Students should check the due time for each homework assignment in Canvas regularly. There will be a reduction of 10% in that assignment's grade for each day that it is late (Max 2 days, assignments will NOT be accepted after 2 days). The purpose of the homework assignments is to help students assess their progress in the class.

2. Lab Activity Assignments (40% of final grade):
   There will be 11 lab activity assignments in this course. They will be based on each week's course content and will be available in Canvas before the lab session. Students will be assigned to groups in Canvas at the beginning of the semester and there will be 3 – 4 students in each group. Students should participate the lab section and work together with their group members to finish the lab assignment throughout the semester. Each group just needs to submit ONE PDF document for each lab assignment to Canvas before the due time. Any group members who contribute little or no work to the lab activities (e.g. did not participate the in-person lab section) will NOT get the credit for that lab assignment. While the grading for the other group members will not be affected. In each submitted lab assignment, each group should report whether this assignment is finished by the joint effort from each member, and mark the member's name who contributed little or no work (e.g. did not participate the in-person lab section). The individual member who did not contribute to the group assignment should finish the whole lab assignment on its own so as to receive a separate credit. Each lab assignment will be due at the end of each Friday of the week. There will be a reduction of 10% in that assignment's grade for each day that it is late (Max 2 days, assignments will NOT be accepted after 2 days). Students are encouraged to bring the laptop or tablet to each lab section to finish the lab assignment.

3. Exams (35% of final grade):
   There will be THREE exams (see schedule for dates). To get credit for the exams, you will have to take the exams during the lecture time. The third exam is the final examination: **A Cumulative Exam** covering all contents in the course.

   Grades for students will be posted via Canvas after each exam. Students are encouraged to come to the instructor's online office hours to review exams, and other assessments.

   Internet connection issues:
   Canvas autosaves responses a few times per minute as long as there is an internet connection. If your internet connection is lost, Canvas will warn you but allow you to continue working on your exam. A brief loss of internet connection is unlikely to cause you to lose your work. However, a longer loss of connectivity or weak/unstable connection may jeopardize your exam.

Other technical difficulties:
Immediately email the instructor a current copy of the state of your exam and explain the problem you are facing. Your instructor may not be able to respond immediately or provide technical support. However, the copy of your exam and email will provide a record of the situation.

Contact the SJSU technical support for Canvas:

Technical Support for Canvas
Email: ecampus@sjsu.edu
Phone: (408) 924-2337
https://www.sjsu.edu/ecampus/how-we-can-help/contact-us.php

If possible, complete your exam in the remaining allotted time, offline if necessary. Email your exam to your instructor within the allotted time or soon after.

"Faculty members are required to have a culminating activity for their courses, which can include a final examination, a final research paper or project, a final creative work or performance, a final portfolio of work, or other appropriate assignment."

"Success in this course is based on the expectation that students will spend, for each unit of credit, a minimum of 45 hours over the length of the course (normally three hours per unit per week) for instruction, preparation/studying, or course related activities, including but not limited to internships, labs, and clinical practica. Other course structures will have equivalent workload expectations as described in the syllabus."

Grading Information

The grading scale for KIN 158 will be in accordance with San Jose State University. The following list of assigned letter grades and their corresponding percentages accrued over the entire semester will be used to determine student performance on graded material. More guidelines on grading information and class attendance can be found from the following university policies:

- University Syllabus Policy S16-9 (http://www.sjsu.edu/senate/docs/S16-9.pdf)
- University Attendance and Participation Policy F15-12 (http://www.sjsu.edu/senate/docs/F15-12.pdf)
- University Grading System Policy F18-5 (http://www.sjsu.edu/senate/docs/F18-5.pdf)

Course Grades:

5 Homework Assignments	250 points = 25%
11 Lab Activity Assignments	400 points = 40%
Exam 1	100 points = 10%
Exam 2	100 points = 10%
Final Exam (cumulative)	150 points = 15%
Total:	1000 points = 100%

Determination of Grades:

Grade	Points	Percentage
A plus	960 to 1000	96 to 100%
A	930 to 959	93 to 95.9%
A minus	900 to 929	90 to 92.9%
B plus	860 to 899	86 to 89.9%
B	830 to 859	83 to 85.9%

Grade	Points	Percentage
B minus	800 to 829	80 to 82.9%
C plus	760 to 799	76 to 79.9%
C	730 to 759	73 to 75.9%
C minus	700 to 729	70 to 72.9%
D plus	660 to 699	66 to 69.9%
D	630 to 659	63 to 65.9%
D minus	600 to 629	60 to 62.9%
F	≤ 599.9	≤ 59.9%

Classroom Protocol

1. All KIN 158 students should attend class regularly, and actively participate in each class and finish the assignments. Students are responsible for all missed course content and assignments.
2. Health Protocol: all the students are required to wear a mask or face coverings during the in-person class section. If the student refuses to comply, the instructor will ask the student to leave the space and it may result in class cancellation. The instructor will report the case to Student Conduct & Ethical Development for non-compliance or disruptive behavior. More details can be found in Santa Clara County Health Order: https://covid19.sccgov.org/order-health-officer-08-02-2021-requiring-all-to-use-face-covering-indoors and SJSU face covering requirements: https://www.sjsu.edu/healthadvisories/sjsu-adapt/plan/index.php#Face%20Coverings/Masks.
3. Classroom Etiquette: The aim for this course is to create an inclusive learning environment where all students feel welcome to participate and are free from judgment. To help create this learning environment, all students are asked to bring a positive attitude to class, be respectful and kind to classmates, and keep an open mind. Students can expect the instructor will do the same.
4. Use of Calculators: you may ONLY use a simple non-programmable calculator during lecture, homework, lab and exams.
5. Late assignments: Points will be deducted for every late assignment at the discretion of the course instructor. There will be a reduction of 10% in that assignment's grade for each day that it is late (Max 2 days, assignments will NOT be accepted after 2 days).
6. Make-up policy: Only under unique circumstances will a student be allowed to make up an exam. No make-up exams will be given without PRIOR (48 hours) approval of the instructor.
7. Requests for consideration of point corrections on examinations must be made within one week after the exam has been returned. These requests must be in writing and can be turned in at the Kinesiology office. Requests made after the one-week time limit will not be considered.
8. Missed Class: If you do miss class, you are encouraged to chat with your instructor during scheduled online office hours or by appointment to avoid falling behind.
9. Email: Please expect the instructor 24-36 hours response time during weekdays. If you email over the weekend, the instructor will likely not be able to respond until Monday.
10. Academic integrity: SJSU academic honesty info can be found at: https://www.sjsu.edu/studentconduct/conduct-processes/academic-integrity.php.
11. For more information on the Department of Kinesiology policies, please refer to the Department of Kinesiology undergraduate program website: https://www.sjsu.edu/kinesiology/programs/undergradutes/.

University Policies

Per University Policy S16-9, relevant university policy concerning all courses, such as student responsibilities, academic integrity, accommodations, dropping and adding, consent for recording of class, etc. and available student services (e.g. learning assistance, counseling, and other resources) are listed on Syllabus Information

web page (https://www.sjsu.edu/curriculum/courses/syllabus-info.php). Make sure to visit this page to review and be aware of these university policies and resources.

Additional Information

Plagiarism

Plagiarism is using someone else's words, data, or ideas and passing them off as your own. Consequences range from failing an assignment, receiving a lower course grade, failing a course, or expulsion from the university. Plagiarism in this course will not be tolerated. If you are not sure what constitutes plagiarism, you are encouraged to take this 15-minute training. Do not hesitate to consult your instructor with further questions.

Religious Holidays

If you have religious holidays that are in conflict with any of the requirements of this class, please let the instructor know immediately so that we can make alternative arrangements.

Accessible Education Center

Students with disabilities who need reasonable accommodations are encouraged to contact the instructor. Accessibility Services is available to facilitate the reasonable accommodations process. They can be reached by phone at (408) 924-6000 or by email: aec-info@sjsu.edu. For more information about the University's program supporting the rights of our students with disabilities see: http://www.sjsu.edu/aec/.

Diversity Statement

The College of Health and Human Sciences strives to create an affirming climate for all students including underrepresented and marginalized individuals and groups. Diversity encompasses differences in age, color, ethnicity, national origin, gender, physical or mental ability, religion, socioeconomic background, veteran status, sexual orientation, and marginalized groups. We believe diversity is the synergy, connection, acceptance, and mutual learning fostered by the interaction of different human characteristics.

Campus Emergency Information

California San Jose State University is committed to being a safe and caring community. Your appropriate response in the event of an emergency can help save lives. Emergency procedures may be found at: http://www.sjsu.edu/emergency/. Please be familiar with these procedures. Information on this page is updated as required. Please review the information on a regular basis. The campus emergency phone is 911. For UPD, call (408) 924-2222.

Earthquake & Fire Preparedness

Earthquake: Duck and Cover until the shaking stops. Use desks, tables and protect your head and neck. Only after the shaking stops should you attempt to leave the building.

Fire: Exit the building rapidly, but calmly. Do not use elevators. Know where your nearest exit is before an emergency occurs.

COVID-19 Vaccine Requirements

On December 22, 2021, the CSU announced that all CSU campuses will require students, faculty and staff accessing university facilities to receive a COVID-19 vaccine booster shot to remain in compliance with the CSU's vaccination policy. **At SJSU, all booster-eligible students who are registered for hybrid or in-**

person classes are required to update their vaccination status and upload a record of their booster shot by January 31, 2022. More details can be found in: https://www.sjsu.edu/medical/services/covid-vaccine.php.

KIN 158 / Biomechanics, Spring, Course Schedule

Course Schedule

Week	Date	Topic	Reading	HW	Lab	PLO #
1	1/25	N/A			No Lab this week	
	1/27	Introduction				
2	2/1	Anatomy Review			Icebreakers & Anatomy	#2
	2/3	Biomechanics Research Methods				
3	2/8	Linear Kinematics	Chapter 2, 3		Linear Kinematics	#1, 4
	2/10	Linear Kinematics (cont'd)	Chapter 2, 3	HW1		
4	2/15	Angular Kinematics	Chapter 5		Angular Kinematics	#1, 4
	2/17	2D Kinematics	Chapter 4	HW2		
5	2/22	Trigonometry Review			Trigonometry & Math	#1
	2/24	Force				
6	3/1	Torque and Lever Class			Torque	#1
	3/3	Static Equilibrium		HW3		
7	3/8	Exam #1 Review			No Lab This Week	#1
	3/10	**Exam #1: 8:00 – 9:00 am**				
8	3/15	Linear Kinetics	Chapter 6, 7		Newton's Laws	#1, 2, 4
	3/17	Linear Kinetics (cont'd)	Chapter 6, 7			
9	3/22	Angular Kinetics	Chapter 8		Kinetics	#1, 2, 4
	3/24	Angular Kinetics (cont'd)	Chapter 8	HW4		
10	3/29	Spring Recess (No Lecture)			No Lab this week	
	3/31	Spring Recess (No Lecture)				
11	4/5	Work, Energy and Power	Chapter 9		Work, Energy and Power	#1, 4
	4/7	Center of Mass				
12	4/12	Tissue Mechanics	Chapter 11		Tissue Mechanics	#1, 4, 5
	4/14	Bone and Muscle	Chapter 11, 12	HW5		
13	4/19	Exam #2 Review			No Lab This Week	#1, 4
	4/21	**Exam #2: 8:00 – 9:00 am**				

Week	Date	Topic	Reading	HW	Lab	PLO #
14	4/26	Gait (walking)	Chapter 2		Gait Analysis	#1, 2, 4
	4/28	Gait (running)				
15	5/3	Lower Extremity	Chapter 14		Stability & Equilibrium	#1, 4
	5/5	Upper Extremity	Chapter 16			
16	5/10	Amputee Gait & Prostheses			No Lab This Week	
	5/12	Final exam review				
Final Exam	5/19	**Final Exam: 7:15 – 9:30 am**				#1, 5

This schedule is tentative. The instructor reserves the right to make changes at any time. Students will be promptly notified if any changes do occur.