

San José State University
College of Applied Sciences and Arts
Kinesiology Department
KIN147, Biomechanical Assessment of Movement, Section 1, Fall, 2018

Course and Contact Information

Instructor:	Tamar Brand-Perez, PT, DPT
Office Location:	Spartan Complex Central, room 234, Biomechanics Lab
Telephone:	Biomechanics lab: (408) 924-4669 Kinesiology department main office: (408) 924-3010 Dr. Brand-Perez cell: (408) 390-0689
Email:	tamar.brand-perez@sjsu.edu
Office Hours:	Tuesday 9am to 10am and Wednesday 1:00pm to 2:00pm. Please contact instructor prior to meeting by email or text.
Lab instructor:	Michelle Ruben, MA
Class Days/Time:	Lecture: 8:30am – 9:20am Monday Lab twice a week: Monday and Wednesday 9:30am – 11:20am or Monday and Wednesday 2pm – 3:50pm or Monday and Wednesday 4pm – 5:50pm
Classroom:	Lecture: Spartan Complex East 160 Lab: Spartan Complex Central, room 234, Biomechanics Lab
Prerequisites:	KIN158 (min C-)

Course Format

Required Technology

For successful completion of this course, a computer is recommended. During lab time, there are computers in the biomechanics lab with the necessary software installed on them. In addition, there are 5 laptops available as loaners from the biomechanics lab, those can be signed out for use at home. Contact the instructor for more details.

Kinovea motion analysis software – Kinovea is a free software. Kinovea will be used for a portion of this course.

Kinovea is for PC only. If you have an Apple computer you can use Bootcamp to download Kinovea on your Apple computer or use the lab computers.

Download this software from <https://www.kinovea.org/> There are two versions for this software. A stable version and an experimental version. You can choose which version you want to download. The experimental version has more tools but may also have more bugs. To download the stable version 0.8.15 press on the large green button in the link above. To download the experimental version, in the same website, go to the link right below the large green download button. The experimental version is 0.8.26.

MYSJSU Messaging

Course materials such as syllabus, schedule, lecture slides, lab guides etc can be found on [Canvas Learning Management System, course login website](#) at <http://sjsu.instructure.com>. You are responsible for regularly checking your SJSU email and Canvas through [one.SJSU](#) at <https://one.sjsu.edu/> or [MySJSU](#) at <http://my.sjsu.edu> for class updates.

Course Description

This course is designed to assist the student in becoming familiar and proficient with the biomechanical methods and equipment for assessing human movement performance characteristics with the following goals: improving movement effectiveness, preventing injuries, and assessing rehabilitation progress.

Course Goals

The student will understand and will successfully use biomechanical methods and equipment to analyze human movement with the goal of improving movement effectiveness, preventing injury and assessing rehabilitation progress.

Course Learning Outcomes:

1. Use professional biomechanical terminology such as displacement, velocity, acceleration, force, torque, vector, to all assignments in the course including: Final project, mini experiments and exams. Terminology should be used accurately.
2. Determine the appropriate method and equipment to be used for evaluation of movement as demonstrated in class assignments.
3. Demonstrate the ability to conduct qualitative and quantitative biomechanical analysis using tools including Kinovea software, EMG, Vicon 3D motion analysis software, as detailed in class projects.
4. Demonstrate practical knowledge of anatomical landmarks and palpation relevant for appropriate use of biomechanical equipment such as the Vicon 3D motion analysis system.
5. Accurately measure kinetic and kinematic variables using MMT, ROM techniques for selected motions.
6. Clearly present the final project demonstrating an improved understanding of how to prevent injury, maximize performance, and assess new products and training programs, based on the biomechanical concepts learned in class.
7. Demonstrate active learning of class content as detailed in the syllabus such as assessment of kinetic and kinematic variables of motion.
8. Discuss current trends relevant to class content using judgement in appraising evidence.
9. Practice critical thinking and analysis skills in the context of biomechanical analysis of human motion.

Department Learning Outcomes:

Department of Kinesiology SJSU: http://www.sjsu.edu/kinesiology/learning_outcomes/

Teaching Methods and Learning Experiences:

Didactic lectures and demonstrations accompanied by slides, videos, models, handouts, and relevant published research will be utilized in the lecture portion of the class. In addition, small group activities will enable refinement of concepts learned. Lab time will be devoted to application of the material using tools such as Kinovea motion analysis software, Vicon 3D motion capture system, force plates and EMG, as well as practice of skills such as Manual muscle testing, range of motion evaluation, palpation and surface anatomy. Lab content will guide students through the process of critical inquiry in the context of biomechanics.

Required Texts/Readings

Textbook

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

Other Readings

1. Neumann DA (2017) Kinesiology of the Musculoskeletal System: Foundations for Rehabilitation, 3rd ed. St Louis, MO, Elsevier. ISBN: 978-0-323-28753-1
2. Atlas of anatomy: Any atlas will be helpful. It does not have to be the latest edition. Some examples include: Netter, Moore, Rohen, Thieme etc.

Other Technology Requirements

As mentioned above, for successful completion of this course, a computer is recommended. During lab time, there are computers in the biomechanics lab with the necessary software installed on them. Additional open lab time will be offered to facilitate completion of class projects. In addition, there are 5 laptops available as loaners from the biomechanics lab those can be signed out for use at home. Contact the instructor for more details.

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Subject Librarian

Kinesiology

Poo, Adriana

Phone: (408) 808-2019

Email: adriana.poo@sjsu.edu

Course Requirements and Assignments

1. Attendance and participation in all lectures and labs.
2. 4 practical quizzes
3. 6 lab mini experiments with presentations
4. Final project
5. Three exams

Course grades:

4 practical quizzes	160 points = 16%
6 lab mini experiments	240 points=24%
Final project	200 points = 20%
Exam 1	100 points = 10%
Exam 2	100 points = 10%
Exam 3 (cumulative)	200 points = 20%
Total:	1000 points = 100%

Quizzes:

There will be 4 practical quizzes throughout the course. They will be based on class and lab content and will be given during lab time. It will not be possible to take the quiz at any other time except for the one time it is offered in class. Each practical quiz is worth 4% of the final grade.

6 Lab Mini Experiments:

There will be six lab mini experiments. These will be done in lab in small groups. At the end of each mini experiment cycle (approximately 2 weeks) each group will present their work to the rest of their lab group. For more details please see mini experiment requirements on Canvas.

Final Project:

At the conclusion of the course, the students will present their final project in front of their lab group. Each small group will have approximately 20-30 minutes to present their work. The final project is worth 20% of the final grade. Please see final project guidelines on Canvas for further details.

Examinations:

There will be 3 exams taken during lab hours in lab (see schedule for dates). To get credit for the exams, you will have to take the exams in lab. Exams are comprised of multiple choice, fill-in the blanks, drawing and short answer questions. The third exam is the final Examination: A **cumulative exam** covering all content in the course.

Grading Scale:

The grading scale for KIN 147 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.

<http://info.sjsu.edu/web-dbgen/narr/catalog/rec-16334.16407.16438.16439.html>

A = 100 – 92.5
A- = 92 – 89.5
B+ = 89 – 86.5
B = 86 – 82.5
B- = 82 – 79.5
C+ = 79 – 76.5
C = 76 – 72.5
C- = 72 - 69.5
D+ = 69 – 66.5
D = 66 - 62.5
D- = 62 – 59.5
F = 59 and below

Feedback:

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

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.

Classroom Protocol

1. Use of calculators: You may ONLY use a simple non-programmable calculator during lecture, lab and exams. Using an improper calculator or CELL PHONE is a form of cheating and will be punished by a zero grade for the first offense and course failure and referral to the University Disciplinary Committee for any subsequent offense.
2. Late assignments: Points will be deducted for every late assignment at the discretion of the course instructor. At a minimum, 5% will be deducted per week (Max 2 weeks, assignments will NOT be accepted after 2 weeks).
3. Requests for consideration of point corrections on written examinations must be made within one (1) 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.
4. Students cannot pass the course if less than 62% average was earned on the three exams, less than 62% average on the mini experiments, less than 62% average is earned on the practical quizzes and less than 62% is earned on the final project.
5. Any make-up exams are at the discretion of the instructor. NO Make-up Exams will be given without PRIOR (48 hours) approval of the Instructor.
6. No make-up mini experiments will be offered. Make-up practical quizzes will be at the discretion of the instructor. NO Make-up practical quizzes will be given without PRIOR (48 hours) approval of the Instructor.
7. Lecture and lab participation are expected. The student is expected to be punctual, prepared and interactive for ALL course sessions. In addition, it is NOT the responsibility of the instructor to get the materials to the student OR reteach any materials missed during a course session unless previous arrangements have been made. If the student is NOT able to attend a scheduled course session, then the student is expected to notify the COURSE INSTRUCTOR before the scheduled class session in order to

receive an EXCUSED absence. Unexcused absences or consistent tardiness are unacceptable and ***not consistent with professional behavior.***

For this class: following two (2) unexcused absences or two episodes of tardiness, the student will be given a verbal warning that this pattern of behavior needs to change. Continued unexcused absences or tardiness will result in a loss of points for each unexcused absence or late arrival that follows the warning, as well as meetings with the course director and your advisor.

6. Academic honesty: SJSU Academic honesty info can be found at: <http://info.sjsu.edu/static/schedules/integrity.html>
8. Professional behavior is expected at all times with instructors and classmates. This includes commitment to learning, efficient use of time, effective communication, effective interpersonal skills, appropriate use of constructive feedback, stress management, compliance with dress and personal appearance, professional conduct and respect for students, and faculty. For more information regarding university and department expectations please refer to the following link: <http://www.sjsu.edu/aars/slo/>
9. For more information on the department of Kinesiology policies please refer to the department of kinesiology undergraduate program website: <http://www.sjsu.edu/kinesiology/programs/undergraduates/>

USE OF LAPTOPS AND PHONES:

APPROPRIATE use of laptops during lectures or labs is encouraged in order to access prior class material and online resources for the purpose of small group activities. Use of laptops, iPads, or other notebook devices during lectures or labs for checking email or purposes other than learning the course material currently being taught is distracting to fellow students and unprofessional. Please use breaks and lunch time for other uses of your electronic devices.

Use of phones during class is NOT APPROPRIATE for any reason except in an emergency. Please be courteous to those around you and silence your phones during class. Even phones set on vibrate can be loud and distracting.

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/>

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.

In the event of an earthquake

Duck and Cover

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

NOTE: FIRE- EXIT building rapidly, but calmly ALWAYS- Remain calm- DO NOT USE ELEVATORS
CAMPUS EMERGENCY PHONE IS 911

PREPARE AHEAD Carry a Survival Kit in your car at all times. Minimally, be sure you have 1 gallon of water, a blanket, warm clothing, flashlight, and a portable radio. Ideally have a first aid kit and some food, too.

<http://www.sjsu.edu/police/prepare/earthquake/>

KIN147 Biomechanical Assessment of Movement Schedule Fall 2018

Lecture: Monday 8:30am – 9:20am

Lab: Two labs per week: Monday and Wednesday 9:30am – 11:20am or

Monday and Wednesday 2pm – 3:50pm or

Monday and Wednesday 4pm – 5:50pm

Week	Date	Activity	Topic	Resources: Flanagan=F Mansfield/ Neumann= M/N	Assignments:
Week 1	8/27	Lecture	Introduction; review of syllabus and schedule		
	8/27	Lab	Anatomy review – bony landmarks; Apps		
	8/29	Lab	Anatomy review - muscles		
Week 2	9/3	Labor Day	No lecture		
	9/3	Labor Day	No lab		
	9/5	Lab	Anatomy quiz; Mini experiment 1 – linear motion		Anatomy practical quiz
Week 3	9/10	Lecture	Assessment of linear motion		
	9/10	Lab	Mini experiment 1 – cont'd		Presentation of mini experiment 1
	9/12	Lab	Kinovea introduction; Final project – linear motion		
Week 4	9/17	Lecture	Assessment of angular motion		
	9/17	Lab	Range of motion; mini experiment 2 – angular motion		

	9/19	Lab	Range of motion; mini experiment 2 – cont'd		Range of motion practical quiz
Week 5	9/24	Lecture	Exam 1 review		
	9/24	Lab	Mini experiment 2 – cont'd; Final project - angular motion		Mini experiment 2 presentation
	9/26	Lab	Exam 1		
Week 6	10/1	Lecture	2D/3D motion analysis software		
	10/1	Lab	Palpation; Mini experiment 3 – 2D/3D motion analysis software		
	10/3	Lab	Mini experiment 3 – cont'd; Final project - 2D/3D motion analysis software		Palpation practical quiz
Week 7	10/8	Lecture	2D/3D motion analysis software – cont'd		
	10/8	Lab	Mini experiment 3 – cont'd; Final project - 2D/3D motion analysis software;		
	10/10	Lab	Mini experiment 3 – cont'd Final project - 2D/3D motion analysis software;		Presentation of mini experiment 3
Week 8	10/15	Lecture	Assessment of internal force - MMT		
	10/15	Lab	MMT		
	10/17	Lab	EMG demonstration; Mini experiment 4 – internal force		MMT practical quiz
Week 9	10/22	Lecture	Assessment of internal force - EMG		
	10/22	Lab	Mini experiment 4 – cont'd; Final project – internal force		
	10/24	Lab	Mini experiment 4 – cont'd		Presentation of mini experiment 4

Week 10	10/29	Lecture	Assessment of external force		
	10/29	Lab	Final project – external force; Mini experiment 5 – external force		
	10/31	Lab	Mini experiment 5 – cont’d		
Week 11	11/5	Lecture	Exam 2 review		
	11/5	Lab	Mini experiment 5 – cont’d		Presentation of mini experiment 5
	11/7	Lab	Exam 2		
Week 12	11/12	Veteran’s Day	No lecture		
	11/12	Veteran’s Day	No lab		
	11/14	Lab	Mini experiment 6 - Qualitative analysis		
Week 13	11/19	Lecture	Qualitative analysis		
	11/19	Lab	Mini experiment 6 – cont’d; Final project – qualitative analysis		Presentation of mini experiment 6
	11/21	Thanksgiving Holiday	No lab		
Week 14	11/26	Lecture	Gait analysis		
	11/26	Lab	Gait analysis		
	11/28	Lab	Gait analysis – cont’d		
Week 15	12/3	Lecture	Gait analysis – cont’d		
	12/3	Lab	Final project prep		
	12/5	Lab	Final project presentation		
Week 16	12/10	Lecture	Final exam review		
	12/10	Lab	Final project presentation; Final exam review		
	12/12	Lab	Final exam		
	12/21		End of semester Happy holidays!		