

BIOMECHANICS

Department of Kinesiology

CALIFORNIA STATE UNIVERSITY, NORTHRIDGE

Fall 2008	KIN 345 16164 K Dino Vrongistinos	M 11:00-13:45	Location: RE155
Fall 2008	KIN345L 16167 Jason Ue	W 11:00-13:50	Location: RE174
Fall 2008	KIN345L 16168 Christopher McClain	F 11:00-13:50	Location: RE174

Instructor: Konstantinos “Dino” Vrongistinos, Ph.D.	e-mail: kv61497@csun.edu
Office: KN281	Phone: (818)-677-7567
Office Hours: M,W 14:00-15:00, T, 13:00-14:00, & by appointment	http://www.csun.edu/~kv61497

Required Text: 345: *Basic Biomechanics* by S.J. Hall (5th), WCB/McGraw Hill.
 345L: *Biomechanics Lab Manual* (purchase at Quick-Copies -- Inside Bookstore)

Course Prerequisites: Biology 211/212 or KIN 275, and KIN300; passing score on ELM Co-requisite: KIN 345L.

Course Description: Biomechanical analysis of human movement based on anatomical concepts and mechanical laws of motion. Analysis of the ways in which anatomical makeup and mechanical laws govern the mechanics of human motion.

The Department of Kinesiology has six Student Learning Outcomes (SLO):

1. Demonstrate an understanding of the multi-disciplinary and integrated nature of kinesiology.
2. Apply, integrate and communicate kinesiological principles and movement-related knowledge across diverse settings and populations to enhance quality of life and encourage adoption of healthy lifestyles.
3. Apply innovative technology to understand and enhance human movement.
4. Demonstrate commitment to professional growth.
5. Demonstrate reasoning, problem solving, critical thinking, and reflective strategies in the pursuit and application of movement related knowledge.
6. Develop and apply assessment tools to measure and evaluate movement program efficacy.

SLOs are aligned with the following Course Objectives as indicated in brackets [SLO #].

Course Objectives: To provide students with the knowledge and skills to be able to:

- (1) Apply mechanical laws and principles of applied physics to anatomical structures [SLO #2, 5].
- (2) Describe how musculoskeletal structures influence human movement [SLO #2].
- (3) Apply kinematic & kinetic descriptors and measures to human movements [SLO #2, 5].
- (4) Analyze the biomechanical correlates of specific skills and techniques [SLO #2, 5].
- (5) Analyze selected injury and performance mechanisms [SLO #2, 5].
- (6) Assess movement patterns characteristic of special populations, including individuals with disabilities, throughout the lifespan [SLO #2, 3].

Evaluation: Course grades will be based on the following point distribution. Separate grades will be given for 345 and 345L.

345 (3 units)		
Exam #1	(5 th Week)	200 pts (20%)
Exam #2	(8 th or 9 th Week)	200 pts (20%)
Exam #3	(14 th Week)	200 pts (20%)
Final Exam	(Final’s Week)	400 pts (40%)
Course Total		1000pts (100%)

Assignment of grades will be based on the following ranges:

A = 900-1000 pts;	B = 800-899 pts;	C = 700-799 pts;	D = 600-699 pts;	F = less than 600 pts.
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Assignment of plus/minus grade adjustments to the above scale will be determined by the final class point distribution.

345L (1 unit) Evaluation criteria to be announced in lab by instructor

Examination Policies & Miscellaneous Information

1. Students will **not** be allowed to leave the room during exams. Please attend to any personal needs before the exam.
 2. Make-up exams will be considered only under exceptional circumstances.
(Note: "I overslept", "I'm tired", "I'm not prepared", etc. are **not** exceptional circumstances!)
 - Any student who fails to contact the instructor prior to any missed exam may **not** be allowed to makeup the exam.
 3. Absence for medical reasons requires written verification by a physician.
 4. Exams will **not** be rescheduled based on a student's personal work/school schedule. Please plan ahead.
 5. Questions/concerns regarding grading for any exam must be resolved with the instructor within **one week** of the date graded-exams are returned to the student.
 6. All exams are non-circulating.
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- A. *Time Elements* Class begins promptly on the scheduled hour
- B. *Behavior* Treat other students and the instructor with respect and civility. Free discussion, inquiry, and expression is encouraged in this class. Classroom behavior that interferes with either (a) the instructor's ability to conduct the class or (b) the ability of students to benefit from the instruction is not acceptable. Examples may include routinely entering class late or departing early; use of beepers, cellular phones, or other electronic devices; repeatedly talking in class without being recognized; talking while others are speaking; or arguing in a way that is perceived as "crossing the civility line." Eating food or chewing ice during lecture or discussion time is unacceptable. Turn-off cellular phones and other communications electronics
- C. *Cheating & Plagiarism* will not be tolerated. Severe penalties will be imposed including an F on the exam, and potentially an F in the course, and may also be subject to more severe discipline by the University. Please review the Student Conduct on Academic Dishonesty in the current Schedule of Classes and in the University Catalog.
Each student is expected to be familiar with, and abide by, the conditions of student conduct, as presented in the CSUN Catalog (Appendix C), with emphasis on sections: Student Conduct Code, Academic Dishonesty, Faculty Policy on Academic Dishonesty, and Penalties. Any student engaging in academic dishonesty (e.g., cheating, fabrication, facilitating academic dishonesty, plagiarism) is subject to discipline, which may include a failing grade in the course, and may also be subject to more severe discipline by the University.
- D. *Assignments* turned in one day late will receive 50% credit. After one day, no credit will be given.
- E. Requests for an Incomplete (I) must confirm to university policies. Among other requirements, "I" is possible only for instances in which a student is demonstrating passing work in the class.

F. Attendance Policy: Attendance is expected for this class, and each student is responsible for all material covered along with any changes to the syllabus that are discussed in class. Any foreseeable absences should be discussed with the professor beforehand. If an emergency arises, telephone or email before class so that there is a record. If I do not receive any prior notification, I will not allow make-ups for any material missed (i.e., exams, homework). Attendance is checked randomly and during tests and assignments due days. If students miss more than three classes with no excuse, there will be five percent deduction on their final grade.

Reading Assignments

Please Note:

The reading assignments listed below are intended to *supplement* the lecture materials. Some of the material in the text will not be covered in lecture but may be included on the exams. By the same token, all of the information given in lecture will not be found in the text, but may also be included on the exams. Students are expected to have read the assigned sections in the text *before* the scheduled lectures to which they apply. (Reading assignment schedule subject to change with appropriate notice).

Due days and assignments may be posted on WebCT. Students are expected to be proficient with WebCT early on the semester.
webteach.csun.edu

Note: **Students with exceptional needs:** This instructor, in conjunction with California State University Northridge, is committed to upholding and maintaining all aspects of the federal Americans with Disabilities Act (ADA) of 1990 and Section 504 of the Rehabilitation Act of 1973. If you are a student with a disability and wish to request accommodations, please contact the **Center on Disabilities** located in Student Services Building BH 110, or call (818) 677-2684 for an appointment.
<http://www.csun.edu/cod/> , codss@csun.edu, Phone: (818) 677-2684, Fax: (818) 677-4929, Office Hours: M - F 8:00-16:45
Any information regarding your disability will remain confidential. Because many accommodations require early planning, requests for accommodation should be made as early as possible. Any requests for accommodations will be reviewed in a timely manner to determine their appropriateness for this class.

Attention: Last day to drop is Friday of the 3rd week of classes

Basic Biomechanics Susan J. Hall, Ph.D.

	M			Reading Materials
Aug	25	Introduction & Anatomy Review	Week 1	Ch. 2, 4, 7
Sep	1	No class Labor Day		
	8	Functional Anatomy -- Joints	Week 2	Ch. 8, 9, 5
	15	Joint / Muscle Function Muscle Mechanics	Week 3	Ch. 5, 6
	22	Muscle Mechanics	Week 4	Ch. 5, 6
	29	Exam for W1 to W4 Two Joint Muscles	Week 5 Exam #1	Exam #1 on Ch. 2,5,6 and <u>Anatomy Material</u>
Oct	6	Kinematics Linear	Week 6	Ch. 1, 10, 11
	13	Kinematics Angular	Week 7	Review: Ch. 1, 10, 11 -- Ch. 3, 12, 13, 14
	20	Projectile Review Kinematics	Week 8	-- Ch. 3, 12, 13, 14
	27	Forces -- Newton's Laws,	Week 9 Exam #2	(Exam #2 on Ch. 1,10,11) Ch. 3, 12, 13, 1
Nov	3	Forces -- Newton's Laws, Torque, COM	Week 10	Ch. 3, 12, 13, 1 Assignment on Kinematics and COG
	10	COM & Stability, Friction, Work, Power, Energy,	Week 11	Ch. 3, 12, 13, 14
	17	Linear Momentum Angular Momentum	Week 12	Ch. 3, 12, 13, 14
	24	Levers & Torques	Week 13	Ch. 3, 12, 13, 14
Dec	1	Fluid Mechanics	Week 14 Exam #3	(Exam #3 on Ch. 3,12,13,14) Ch. 15
	8	Injury-Integrative Biomechanics	Week 15	Review, Topics -Articles
Dec 11-17 Finals	15	Monday December 15 10:15am-12:15 pm (if no conflicts)	Final Exam Dec 15	FINAL Monday December 15 10:15am-12:15 pm (if no conflicts)

Schedule is tentative and subject to changes