



KINE 3301 Biomechanics of Human Movement Fall 2013

Instructor:	Dr. Mark Ricard	Office:	MAC 230
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Office Hours: By appointment

Location & Time: Lecture – MAC 206, Tue & Thur 12:30 – 1:50 PM
Labs – MAC 213, Mon, Tue, Wed, Thur, Fri: 2:00 – 2:50 PM

Faculty Profile: <https://www.uta.edu/mentis/profile/?445>

Prerequisites: KINE 1400, 3300, BIOL 2457 and MATH 1302, or permission of instructor.

Required Textbook: Mark D. Ricard, (2013) [Applied Biomechanics 2nd ed. ISBN 978-1492223580](#), Biomech Publications.

Other Requirements: i>clicker2 – 1429280476
Scientific calculator with \tan , \tan^{-1} , \sin , \cos , x^2 , \sqrt{x}

Course Description: **KINE 3301 BIOMECHANICS OF HUMAN MOVEMENT** (2-2) Quantitative and qualitative analyses of human movement. Emphasis on the application of the principles of human movement, with consideration of functional anatomy, kinesiology and mechanical concepts to exercise, sport, and activities of daily living.

Student Learning Outcomes:

The student should be able to:

1. Visually recognize movements (when demonstrated by your instructor) and write the specific movement, the plane of movement, and the axis of movement.
2. Systematically analyze sports skills and common exercises used in conditioning programs and rehabilitation.
3. Write mechanical principles and give examples of their application to several different sports and human movement situations.
4. Write a detailed descriptive and mechanical analysis of a sport skill, including the major muscle groups used in executing the skill.
5. Solve basic mechanics problems related to human movement.
6. Identify, analyze and evaluate the mechanics of fundamental motor skills such as kicking, throwing, walking, running and jumping.
7. Identify the biomechanical factors that discriminate between mature and immature movement patterns.
8. Identify and explain the role of body organs in human movement.
9. Identify how the bone, muscle, ligament and tendons respond to mechanical stress.
10. Demonstrate knowledge of how the muscular and nervous systems relate to the mechanics of movement.
11. Demonstrate the ability to analyze the mechanics of fundamental movement patterns and sport movement patterns.

Athletic Training Competencies

The following Athletic Training Educational Competencies are addressed in this course:

Orthopedic Clinical Examination and Diagnosis: C4, C5

Conditioning and Rehabilitative Exercise: C2

Grading

Grades in this course will be based on the following percentages:

Exams (3):	60%
Lecture Quizzes	10%
Homework & Lab Quizzes	10%
Comprehensive Final Exam	20%

Grading Scale:

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

Attendance Policy: Attendance is required. Iclicker2 quizzes will be given daily in lecture and lab. All missed quizzes will be assigned a zero.

----- Tentative Course Schedule -----	
Aug 22	Chapter 1: Introduction to Biomechanics
Aug 27	Chapter 2: Vectors and Scalars
Aug 29 – Sept 3	Chapter 3: Linear Kinematics
Sept 5	Chapter 4: Linear Kinematics Applications
Sept 10 - 12	Chapter 5: Projectiles
Sept 17	Chapter 6: Angular Kinematics
Sept 19	Review for Test 1
Sept 24	Test 1
Sept 26	Chapter 7: Linear Kinetics
Oct 1	Chapter 8: Linear Momentum
Oct 3	Chapter 9: Linear Impulse – Momentum Applications
Oct 8	Chapter 10: Work, Power and Energy
Oct 10	Chapter 11: Torque
Oct 15	Chapter 12: Center of Mass
Oct 17	Chapter 13: Angular Impulse & Angular Momentum
Oct 22	Review for Test 2
Oct 24	Test 2
Oct 29	Chapter 14: Mechanical Responses of Biological Materials
Oct 31	Chapter 15: Exercise Adaptations to Biological Materials
Nov 5	Chapter 16: Muscle Excitation – Contraction Coupling
Nov 7	Chapter 17: Muscle Force – Velocity, Force – Length, and Stretch – Shorten
Nov 12	Chapter 18: Motor Neurons and Electromyography
Nov 14	Chapter 19: Sensory Receptors and Reflexes
Nov 19	Chapter 20: Postural Control
Nov 19	Review for Test 3
Nov 26	Test 3
Dec 3	Last Day of Class
Dec 12	Final Exam 11:00 AM – 1:30 PM

Make-up Exams: If you miss an exam due to illness or a planned trip it is your responsibility to arrange a make-up exam.

Expectations for Out-of-Class Study: Beyond the time required to attend each class meeting, students enrolled in this course should expect to spend at least an additional 9 hours per week of their own time in course-related activities, including reading required materials, completing assignments, preparing for exams, etc.

Drop Policy: Students may drop or swap (adding and dropping a class concurrently) classes through self-service in MyMav from the beginning of the registration period through the late registration period. After the late registration period, students must see their academic advisor to drop a class or withdraw. Undeclared students must see an advisor in the University Advising Center. Drops can continue through a point two-thirds of the way through the term or session. It is the student's responsibility to officially withdraw if they do not plan to attend after registering. **Students will not be automatically dropped for non-attendance.** Repayment of certain types of financial aid administered through the University may be required as the result of dropping classes or withdrawing. For more information, contact the Office of Financial Aid and Scholarships (<http://www.uta.edu/aao/fao/>).

Americans with Disabilities Act: The University of Texas at Arlington is on record as being committed to both the spirit and letter of all federal equal opportunity legislation, including the *Americans with Disabilities Act (ADA)*. All instructors at UT Arlington are required by law to provide "reasonable accommodations" to students with disabilities, so as not to discriminate on the basis of that disability. Any student requiring an accommodation for this course must provide the instructor with official documentation in the form of a letter certified by the staff in the Office for Students with Disabilities, University Hall 102. Only those students who have officially documented a need for an accommodation will have their request honored. Information regarding diagnostic criteria and policies for obtaining disability-based academic accommodations can be found at www.uta.edu/disability or by calling the Office for Students with Disabilities at (817) 272-3364.

Academic Integrity: Students enrolled in this course are expected to adhere to the UT Arlington Honor Code:

I pledge, on my honor, to uphold UT Arlington's tradition of academic integrity, a tradition that values hard work and honest effort in the pursuit of academic excellence.

I promise that I will submit only work that I personally create or contribute to group collaborations, and I will appropriately reference any work from other sources. I will follow the highest standards of integrity and uphold the spirit of the Honor Code.

UT Arlington faculty members may employ the Honor Code as they see fit in their courses, including (but not limited to) having students acknowledge the honor code as part of an examination or requiring students to incorporate the honor code into any work submitted. Per UT System *Regents' Rule* 50101, §2.2, suspected violations of university's standards for academic integrity (including the Honor Code) will be referred to the Office of Student Conduct. Violators will be disciplined in accordance with University policy, which may result in the student's suspension or expulsion from the University.

Student Support Services: UT Arlington provides a variety of resources and programs designed to help students develop academic skills, deal with personal situations, and better understand concepts and information related to their courses. Resources include tutoring, major-based learning centers, developmental education, advising and mentoring, personal counseling, and federally funded programs. For individualized referrals, students may visit the reception desk at University College (Ransom Hall), call the Maverick Resource Hotline at 817-272-6107, send a message to resources@uta.edu, or view the information at www.uta.edu/resources.

Electronic Communication: UT Arlington has adopted MavMail as its official means to communicate with students about important deadlines and events, as well as to transact university-related business regarding financial aid, tuition, grades, graduation, etc. All students are assigned a MavMail account and are responsible for checking the inbox regularly. There is no additional charge to students for using this account, which remains active even after graduation. Information about activating and using MavMail is available at <http://www.uta.edu/oit/cs/email/mavmail.php>.

Student Feedback Survey: At the end of each term, students enrolled in classes categorized as “lecture,” “seminar,” or “laboratory” shall be directed to complete an online Student Feedback Survey (SFS). Instructions on how to access the SFS for this course will be sent directly to each student through MavMail approximately 10 days before the end of the term. Each student’s feedback enters the SFS database anonymously and is aggregated with that of other students enrolled in the course. UT Arlington’s effort to solicit, gather, tabulate, and publish student feedback is required by state law; students are strongly urged to participate. For more information, visit <http://www.uta.edu/sfs>.

Final Review Week: A period of five class days prior to the first day of final examinations in the long sessions shall be designated as Final Review Week. The purpose of this week is to allow students sufficient time to prepare for final examinations. During this week, there shall be no scheduled activities such as required field trips or performances; and no instructor shall assign any themes, research problems or exercises of similar scope that have a completion date during or following this week *unless specified in the class syllabus*. During Final Review Week, an instructor shall not give any examinations constituting 10% or more of the final grade, except makeup tests and laboratory examinations. In addition, no instructor shall give any portion of the final examination during Final Review Week. During this week, classes are held as scheduled. In addition, instructors are not required to limit content to topics that have been previously covered; they may introduce new concepts as appropriate.

Emergency Exit Procedures: Should we experience an emergency event that requires us to vacate the building, students should exit the room and move toward the nearest exit, [which is located on each side at the front of MAC 206, and the back center and south side of the rear of the classroom](#). When exiting the building during an emergency, one should never take an elevator but should use the stairwells. Faculty members and instructional staff will assist students in selecting the safest route for evacuation and will make arrangements to assist handicapped individuals.