

Spring 2009

KINE 3301 Biomechanics of Human Movement (3 hr credit)

Instructor: Dr. Mark Ricard Office: MAC 220

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Office Hours: By appointment

Location & Time: Lecture – SH 331, Tue & Thr 12:30 – 1:50 PM
Labs -- PEB 303 & MAC 132, Tue or Thr 2:00 – 2:50 PM

Course Description: 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.

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

Textbook: McGinnis P. (2005) **Biomechanics of Sport and Exercise**. (2nd Ed), Human Kinetics, Champaign, IL, ISBN 0-7360-5101-5.

Objectives of the Course:

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 (2):	50%
Comprehensive Final Exam	30%
Homework & Lab Assignments	10%
Quizzes	10%

Grading Scale:

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

----- Tentative Course Schedule -----	
Week 1	Introduction: Why Study Biomechanics
Week 2	Chapter 1: Forces: Maintaining Equilibrium or Changing Motion
Week 3	Chapter 2: Linear Kinematics: Describing Objects in Linear Motion
Week 4	Chapter 3: Linear Kinetics: Explaining the Causes of Linear Motion
Week 5	Chapter 4: Work, Power, and Energy: Explaining the Causes of Motion Without Newton
Review for Test 1	
Test 1 Chapters Intro - 4	
Week 6	Chapter 5: Torques and Moments of Force: Maintaining Equilibrium or Changing Angular Motion
Week 7	Chapter 6: Angular Kinematics: Describing Objects in Angular Motion
Week 8	Chapter 7: Angular Kinetics: Explaining the Causes of Angular Motion
Review for Test 2	
Test 2 Chapters 5 - 7	
Week 9	Chapter 9: Mechanics of Biological Materials: Stresses and Strains on the Body
Week 10	Biomechanics of Injury and Rehabilitation
Week 11	Chapter 10: The Skeletal System: The Rigid Framework of the Body
Week 12	Chapter 11: The Muscular System: The Motors of the Body
Week 13	Muscle Mechanics and Electromyography
Week 14	Chapter 12: The Nervous System: Control of the Musculoskeletal System
Week 15	Motor Control and Reflex Applications in Movement
Week 16	Review for Final
Final Exam (Comprehensive Chapters Intro-7, 9-12)	

Drop Policy:

The Department of Kinesiology will not warn students nor drop students for excessive absences. It is the responsibility of the student to complete ADDING, DROPPING or withdrawing from school within the appropriate time frame established by the University Registrar (deadlines to be found in the Schedule of Classes). Any student that does not officially drop the class by the appropriate drop dates will be given an "F" for the course.

Americans With Disabilities Act:

The University of Texas at Arlington is on record as being committed to both the spirit and letter of federal equal opportunity legislation; reference Public Law 93112 – The Rehabilitation Act of 1973 as amended. With passage of new federal legislation entitled Americans With Disabilities Act – (ADA), pursuant to section 504 of The Rehabilitation Act, there is renewed focus on providing this population with the same opportunities enjoyed by all citizens.

As a faculty member, I am required by law to provide **"reasonable accommodation"** to students with disabilities, so as not to discriminate on the basis of that disability. Student responsibility primarily rests with **informing faculty at the beginning of the semester and in providing authorized documentation through designated administrative channels.**

Student Support Services:

The University supports a variety of student success programs to help you connect with the University and achieve academic success. They include learning assistance, developmental education, advising and mentoring, admission and transition, and federally funded programs. Students requiring assistance academically, personally, or socially should contact the Office of Student Success Programs at 817-272-6107 for more information and appropriate referrals.

Academic Dishonesty:

It is the philosophy of The University of Texas at Arlington that academic dishonesty is a completely unacceptable mode of conduct and will not be tolerated in any form. All persons involved in academic dishonesty will be disciplined in accordance with University regulations and procedures. Discipline may include suspension or expulsion from the University. "Scholastic dishonesty includes but is not limited to cheating, plagiarism, collusion, the submission for credit of any work or materials that are attributable in whole or in part to another person, taking an examination for another person, any act designed to give unfair advantage to a student or the attempt to commit such acts." (Regents' Rules and Regulations, Part One, Chapter VI, Section 3, Subsection 3.2, Subdivision 3.22)

Bomb Threats:

If anyone is tempted to call in a bomb threat, be aware that UTA will attempt to trace the phone call and prosecute all responsible parties. Every effort will be made to avoid cancellation of presentations/tests caused by bomb threats. Unannounced alternate sites will be available for these classes. Your instructor will make you aware of alternate class sites in the event that your classroom is not available.

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 syllabi. 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.

Library Policy:

For assistance with your library needs in this course, please consult Antoinette Nelson, UT Arlington Science & Engineering Library, nelsona@uta.edu - 817.272.7433, <http://library.uta.edu/sel>

The University of Texas at Arlington College of Education Mission, Core Values and Professional Dispositions

MISSION: To develop and deliver an educational program that ensures the highest teacher, administrator and allied health science preparation and performance and To be a recognized contributor in the field of educational and allied health science research and practice through effective teaching, quality research and meaningful service. The Educator and Administrator Preparation units' collaboratively developed shared vision is based on these CORE VALUES, dispositions and commitments to:

- Excellence • Diversity
- Learner-centered environment • Technology
- Research-based • Field Experiences
- Collaboration • Life-long Learning

Each candidate in the Educator and Administrator Unit of the College of Education of UT-Arlington will be evaluated on PROFESSIONAL DISPOSITIONS by faculty and staff. These dispositions have been identified as essential for a highly-qualified educator. Instructors and program directors will work with candidates rated as "unacceptable" in one or more stated criteria. The candidate will have an opportunity to develop a plan to remediate any deficiencies.

Demonstrates excellence

- Meets stated expectations of student performance.
- Keeps timelines. Arrives on time for class and other activities.
- Produces significant artifacts of practitioner evidence.
- Possesses a willingness to set goals.
- Attends all classes/trainings and practicum experiences.
- Completes activities as assigned.
- Has appropriate personal appearance and/or hygiene for professional setting.

Participates in a learner centered environment and shows respect for self and others

- Uses appropriate and professional language and conduct.
- Supports a "high quality" learning environment.
- Shows respect and consideration for the thoughts and feelings of others.

Research-based pedagogy

- Has an awareness of and willingness to accept research-based concepts.
- Identifies important trends in education.
- Demonstrates interests in learning new ideas and strategies.
- Relates class discussions and issues to current events in education.

Participates in on-going collaboration with peers and professionals

- Demonstrates kindness, fairness, patience, dignity and respect in working with peers, staff and instructors.
- Works effectively with others.
- Assists others in the university classroom or practicum setting.
- Demonstrates openness to assistance from others.
- Receives feedback in a positive manner and makes necessary adjustment.

Exhibits stewardship of diversity

- Shows appropriate stewardship and tolerance to diverse people, environments, and situations.

Advocates use of technology

- Uses and applies existing technologies sufficiently in work.
- Shows a willingness to use and apply emerging technologies in work.

Shows interest in the learner and the learning-process

- Demonstrates significant learning improvement over time.
- Shows interest in the learning process and demonstrates the necessary amount of time, energy, and enthusiasm for becoming better learners, teachers, and practitioners.