

# KINE 3334 - Biomechanics and Anatomical Kinesiology

## Course Syllabus

**Instructor:** Dr. Fan Gao

**Semester:** fall 2008

**Email:** [Fan\\_Gao@uttyler.edu](mailto:Fan_Gao@uttyler.edu)

**Website:** <http://www.blackboard.uttyler.edu/>  
<http://www.mhhe.com/hall5e>

**Office:** HPC 2166

**Lecture:** W 17:00 – 19:40 pm HPC3055

**Office hours:** MWF 1:00 - 2:00 pm or by Appointment

### Textbook

Hall, S.J. (2006). Basic Biomechanics (5<sup>th</sup> ed.). McGraw-Hill.

Seig, K. & Adams, S. (2002). Illustrated Essentials of Musculoskeletal Anatomy. (4<sup>th</sup> ed.). Megabooks, Inc.

### Course description

Analysis of human movement, applying principles from Newtonian mechanics and study of structure and function of major joints and muscle groups. Co-requisite: KINE 3135. Prerequisite: Credit in anatomy and physiology courses or CI.

### Course objectives

- i. To describe the nature of vector quantities and be able to combine and resolve two-dimensional vectors.
- ii. To define the basic terms involved in kinematics (e.g. velocity, acceleration, etc.)
- iii. To explain the kinematic relationships between linear and angular motion
- iv. To use concepts of kinematics to analyze human motion
- v. To define basic terms involved in the kinetics of linear motion (e.g. force, inertia, momentum, etc.)
- vi. To identify the important characteristics of forces (e.g. magnitude, direction, point of application, components)
- vii. To state Newton's laws of motion and relate them to sports activities
- viii. To explain the effects of significant forces encountered in biomechanical analysis
- ix. To explain the significance of the impulse-momentum, work-energy and conservation of momentum relationships to sports activities
- x. To describe the behavior of projectiles
- xi. To define basic terms involved in the kinetics of angular motion (e.g. angular momentum, moment of inertia, torque)
- xii. To locate the center of gravity of an individual
- xiii. To explain the kinetic relationship between linear and angular motion
- xiv. To determine the mechanical factors basic to the performance of an observed movement, and to evaluate the performer's technique

### Course Requirements

A scientific calculator that can perform trigonometric functions is required for this class. Cell phones/pagers will not be allowed in tests or exams.

## Reading Assignments

Assigned readings are limited to designated sections in the required textbook, and/or to handouts, and assignments found in the class web page.

## Quizzes

An in-class quiz lasting about 10-15 min will be given at the beginning of each class covering the previous weeks lecture material. No makeup is allowed for the in-class quizzes so you are advised to attend each class on time.

## Evaluation

The student will be evaluated based on the performance on examinations (one midterm and one final exam), weekly quizzes and class participation.

## Grading system

Course grade will be calculated as a percentage of total possible points

<i>Midterm exam</i>	120 pts
<i>Final exam</i>	240 pts
<i>Weekly Quizzes (12)</i>	240 pts (20 pts each)
<i>Total possible points</i>	<b>600 pts</b>

*Grading Scale:* A+ = 97%, A = 93-96%, A- = 90-92%, B+ = 87-89%, B = 83-86%, B- = 80-82%, C+ = 77-79%, C = 73-76%, C- = 70-72%, D+ = 67-69%, D = 63-66%, D- = 60-62%

## Policy on Makeup Assignments/Labs, Tests and Examinations

Makeup of missed in class assignments or tests will only be considered under the following conditions and within 3 days of the original due date:

- i. *Illness.* A medical excuse with signature of a physician must be presented.
- ii. *Athletic or other UT Tyler sponsored trips.* Travel dates and times with a signed memo from the supervisor must be presented to the instructor prior to the absence.
- iii. *Religious Holy Days.* A holy day is observed by a religion whose places of worship are exempt from property taxation under section 11.20, Tax Code.
- iv. *Extenuating circumstances.* It is the prerogative of the instructor to approve the makeup.

Note: In all of the above cases, the instructor must be notified of the absence prior to the class assignment, test, or exam.

## Grade Replacement

If you are taking this course for a grade replacement, you must file an intent to receive grade forgiveness with the registrar by the 12<sup>th</sup> day of class. Failure to do so will result in both the original and

repeated grade being used to calculate your overall grade point average. A student will receive grade forgiveness (grade replacement) for only three (undergraduate student) or two (graduate student) course repeats during his/her career at UT Tyler. (2008-2010 Catalog, p. 26)

### **Academic Dishonesty**

Academic dishonesty is a serious offense which includes but is not limited to cheating on exams and plagiarism. The student will receive zero in this course if academic dishonesty is proven.

### **Food and drink in classrooms**

Consumption of food and drink in university classrooms is prohibited.

### **Disability Support Services**

If you have a disability, including a learning disability, for which you request disability support services/accommodation(s), please contact Ida MacDonald in the Disability Support Services office so that the appropriate arrangements may be made. In accordance with federal law, a student requesting disability support services/accommodation(s) must provide appropriate documentation of his/her disability to the Disability Support Services counselor. For more information, call or visit the Student Services Center located in the University Center, Room 282. The telephone number is 566-7079 (TDD 565-5579). Additional information may be obtained at the following link:

<http://www.uttyler.edu/disabilityservices>.

## Course Outline

### Section I Chapters 1-3

Aug 27<sup>th</sup> Chapter 1 What is Biomechanics?

Sept 3<sup>rd</sup> Chapter 2 Kinematic Concepts for Analyzing Human Motion

Sept 10<sup>th</sup> Chapter 3 Kinetic Concepts for Analyzing Human Motion

### Section II Chapters 10-13

Sept 17<sup>th</sup> Chapter 10 Linear Kinematics

Sept 24<sup>th</sup> Chapter 11 Angular Kinematics

Oct 1<sup>st</sup> Chapter 12 Linear Kinetics

Oct 8<sup>th</sup> Chapter 13 Equilibrium

Oct 15<sup>th</sup> Chapter 14 Angular Kinetics

### Oct 22<sup>nd</sup> Midterm Exam

### Section III Chapters 4-6

Oct 29<sup>th</sup> Chapter 4 Human Bone Growth and Development

Nov 5<sup>th</sup> Chapter 5 Skeletal Articulations

Nov 12<sup>th</sup> Chapter 6 Human Skeletal Muscle

### Section IV Chapters 7-9

Nov 19<sup>th</sup> Chapter 7 Upper extremity

Dec 3<sup>rd</sup> Chapter 8 Lower extremity

Dec 10<sup>th</sup> Chapter 9 Spine (no quiz) or a review session

### Final Exam