

# KINE 3050.001 – Biomechanics – Fall 2011

## COURSE SYLLABUS

<b>Instructor:</b>	Jakob L. Vingren, Ph.D.
<b>Office Location:</b>	PEB 210-H
<b>Office hours:</b>	TR 1.00-2.00 PM By appointment (preferred)
<b>Contact Information:</b>	(940) 565-3899 <a href="mailto:jakob.vingren@unt.edu">jakob.vingren@unt.edu</a> <b>Please include KINE 3050.001 in the title of all emails</b>
<b>Teaching assistant</b>	Anthony Duplanty, BS. <a href="mailto:Anthony.Duplanty@unt.edu">Anthony.Duplanty@unt.edu</a>
<b>Email response policy:</b>	I will attempt to answer all emails within 24 hours on Mon-Fri. Students must use their UNT e-mail for any sensitive information – I will not respond with specific student information to e-mails originating from other accounts.
<b>Online:</b>	<u>This class has a section on UNT's Blackboard. USE IT!!!</u>
<b>Lecture Schedule:</b>	TR: 2:00PM-3.20 PM (please be on time and do not leave early without prior approval from the instructor)
<b>Lecture Location:</b>	PEB 216
<b>Required Textbook:</b>	McGinnis, PM. Biomechanics of Sport and Exercise, 2 <sup>nd</sup> ed., 2005.
<b>Additional Resources:</b>	<a href="http://www.mhhe.com/hall5e">http://www.mhhe.com/hall5e</a>
<b>Course Description:</b>	<i>Biomechanics</i> is an introductory course designed to educate kinesiology students on the basic principles of biomechanics and their applications to human movement. This course will involve the analysis of efficient movement through a study of mechanical and anatomical principles and their application to human movement.
<b>Prerequisite(s):</b>	BIOL 2301/2311 (human anatomy), or consent of instructor. <u>Basic mathematics skills (algebra, geometry) are needed to successfully complete this course.</u>
<b>Special accommodations:</b>	Please contact me as soon as possible if you need special accommodations for classes, assignments, or exams. You must register with the UNT Office of Disabilities accommodation before any special accommodation can be made.

**Please keep all cellular devices turned off during class, that also means no-reading or sending text messages etc. They are distracting to the instructor and your fellow students.**

Please see me if you must keep your phone on during class due to potential medical emergencies.

**Course Objectives:****Understand the mechanical aspects of human motion:**

1. Use physical laws of motion to quantitatively and qualitatively analyze human motion and performance.
2. Use physical laws of motion to solve problems of human motion.
3. Gain understanding of the relationship between mechanical properties and anatomical functions.
4. Understand how biomechanical principles can be applied to examine human activities such as sport and orthopedic rehabilitation.

**Course Activities****Examine mechanical properties and how these affect human motion**

- Relate specific physical parameters to human motion, e.g.: force, velocity, acceleration, momentum, torque etc. A specific example: Understanding how muscle force vectors translate into torque generation at specific joints to effect motion (linear & angular).
- Examine biomechanical principles by solving quantitative questions regarding motion. Throughout the semester we will apply mathematics to the physical parameters of specific human motions to achieve an overall understanding of biomechanics.
- Examine how specific anatomical structures affect movement.
- Relate all of the above to everyday activities, especially sport and orthopedic rehabilitation related activity.

**As a result, this course will necessarily draw upon a variety of disciplines including: Anatomy, Physiology, Mathematics, and Physics.**

**Tentative Course Schedule:**

Week	Topics and Exams	Reading etc.	Assignments
1 (8/25)	Class outline/syllabus		
	<b><u>External Biomechanics</u></b>		
2 (8/30)	Introduction Forces	Introduction Appendix A Ch.1	Wiki topic assignment (Thursday 9/1) Lab 1 due (Thursday 9/1)
3 (9/6)	Linear Kinematics	Ch.2	
4 (9/13)	Linear Kinetics	Ch. 3	Lab 2 due (Thursday 9/15)
5 (9/20)	Finish up and Review <i>Exam 1 (Thursday 9-21)</i>		Practical placement and liability forms due (9/22)
6 (9/27)	Work, Power, Energy	Ch. 4	
7 (10/4)	Torques & Moments	Ch. 5	
8 (10/11)	Angular Kinematics	Ch 6	
9 (10/18)	Angular Kinetics	Ch. 7	
10 (10/25)	Finish up and Review <i>Exam 2 (Thursday 10/27)</i>		Friday 10/28 last day to drop course
	<b><u>Internal Biomechanics</u></b>		
11-12 (11/1 & 11/8)	Joints, Bone & Tissue Stress	Ch. 9, 10	
12-13 (11/8 & 11/15)	Ligament & Tendon	Ch. 15	Wiki Due Thursday (11/15)
14-16 (11/22, 11/29 & 12/6)	Muscle	Ch. 11,12	Practical experience paper due (Tuesday 11/22) Wiki Evaluation due (12/8)
17 (12/13)	<i>Exam 3 (Final, 12/13; 1:30 p.m. - 3:30 p.m.)</i>		

**Grading:**

**Item:**

Test 1:	40 points
Test 2:	50 points
Test 3:	50 points
Wiki	35 points
Wiki Evaluation (5 points each for 3 wikis)	15 points
Laboratory assignments (5 points each for 2 assignments)	10 points
<b>Total points available</b>	<b>200 points</b>

**Maximal score:**

40 points
50 points
50 points
35 points
15 points
10 points
<b>200 points</b>

**Final Grade (points)**

A	≥175
B	155-174
C	135-154
D	115-134
F	114 and below

**Failure to participate meaningfully in multiple online discussions:**

**-5points (yes you lose points)**

**Optional assignments:**

Practical biomechanics experience	10 points
Exam/class surveys (1 point each for 4 surveys)	4 points

All grading for this course will be criterion based (i.e. your grade will not depend on the score of other students). There are optional assignments offered, **no additional or extra credit will be offered; please do not ask for any.**

**Attendance:**

There is no grade for attendance but you are expected to attend all classes. Attendance will be tracked through the use of Clickers. From prior semesters results it is clear that it is very difficult to do well or even pass this class without a good/high attendance rate.

**Lecture/reading material exams:**

Exams will cover the material specified in the course calendar unless otherwise delineated by the instructor. Although the exams are not designed to be cumulative, biomechanics is cumulative by nature. Thus, you will be required to use some of the skills you learned in earlier sections during later exams.

**Online Lab assignment:** There are two online lab assignments to be completed this semester. The assignments will be released via Blackboard and the lab report for each assignment must be submitted via Blackboard. You will be able to repeat the labs as many times as you wish (i.e., until you get a perfect score of 5 points).

**Wiki assignment:**

You will be placed in a group of up to six students to create a Wiki (informational website). As a group you are responsible for the final product. Your group will be able to decide on the sport/work discipline for the Wiki, but only one group can write on a particular topic. Topics will be selected during the 3<sup>rd</sup> day of class. The wiki should focus exclusively on biomechanical aspects (broadly defined) of the sport/discipline of your topic. Each team member will also submit a peer-evaluation via Blackboard. The peer-evaluation will NOT be shared with anyone. Further instructions are available on Blackboard. **Deadlines for the Wiki are listed on the Wiki front page.**

**Wiki:**

The group must create a five page Wiki. Page 1: introduction; page 2: linear aspects; page 3: angular aspects; page 4: work/power/energy; page 5 Internal biomechanical aspects. Each page should also contain a research article review (see below). Research citations must be used throughout the Wiki (not from websites, magazines etc). Each page must contain at least 2 citations and thus a minimum of 10 original research articles should be included and properly cited using APA style. For each page of the wiki group must summarize (in about 500 words for each paper) an original research (NOT review) paper (so 5 five papers in total) from the biomechanics literature related to your sport/discipline. All articles should be

approved by the instructor in advance to ensure that they are appropriate for this assignment. [www.pubmed.com](http://www.pubmed.com), [www.highwire.org](http://www.highwire.org), and Sportdiscus through the UNT library website are good source for articles, but be careful in your selection as they also include review articles. There are plenty of free articles so you should NOT have to pay for access to papers, especially if you use the UNT library access.

**Wiki Evaluation:**

You will be asked to read and grade 3 other groups' Wikis. Instructions will be posted on Blackboard.

**Firing of non-contributing Group members:**

If someone in your group is not contributing substantially to the Wiki assignment, the remainder of the group (there must be consensus) has the option to fire that member. The earliest a person can be fired is after the first page of the wiki is due. To fire someone you must give them a week notice (after making sure that they received the notice) so they have the opportunity to correct their efforts. Before giving notice to anyone ensure that you have given them ample and reasonable opportunities to contribute. **You must inform the instructor when you give notice to someone, and the rest of the group must meet with the instructor to obtain approval before anyone is finally fired from the group.** Those students fired from a group will receive a grade of 0 points for the Wiki assignment.

**Writing help:**

The University Writing Center is a good resource for help with the writing portion of this assignment; however, the work (ideas) must be yours. The Center is located in the Auditorium Building, Room 105. Call 565-2563 to make an appointment.

**Optional:**

**Practical biomechanics experience/observation:**

The objective for this assignment is to provide you with an experience in practical or applied aspects of biomechanics. You are expected to complete 5 hours of involvement/observation for this assignment. You are responsible for locating and setting up the appointment(s) with an appropriate agency/location for this experience, as this is an important component of the assignment. At the end of your experience you are to write a 2 page summary paper on your practical experience (see grading rubric for specifics on what to include). A step-by-step guide (including forms and due dates) and the grading rubric for this assignment are posted on Blackboard.

**Surveys:** There are 4 surveys in this course: one after each exam and one just prior to the final (SETE). You must print confirmation for completion of the SETE and bring it to the final to receive credit for that survey.

**Reading Assignments**

Please note: The reading assignments listed in this syllabus 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. **I request and recommend** that you read the assigned sections in the text *before* the scheduled lectures to which they apply. Due to

the nature of the material in this class, it is very difficult to adequately catch up right before exams.

### **Examination Policies**

1. Three exams will be scheduled during the semester. Each exam will consist of objective items (true-false, multiple choice, matching etc.). The exams will not be cumulative. The third exam will be scheduled during our final exam time.
2. Students will **not** be allowed to leave the room during exams and quizzes. Please attend to any personal needs before the exam.
3. Quizzes are administrated at the beginning of class on assigned dates. If you are late you will not be granted additional time to complete the quiz. If you arrive after the quiz has been completed, you will not be allowed to complete the quiz (with the exceptions stated in #4 below).
4. Make-up exams and quizzes will be considered **only** for exceptional circumstances or university approved absence. (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 or quizzes might **not** be allowed to make-up the exam. It is your responsibility to contact the instructor in case of an emergency
5. Absence for medical reasons requires *written dated* verification by a physician.
6. Exams and quizzes will **not** be rescheduled based on a student's personal work/school schedule. Please plan ahead.
7. Questions/concerns regarding grading for any exam, quiz, or assignment must be resolved with the instructor within **one week** of the date graded exams are returned to the student.
8. All exams and quizzes are non-circulating.
9. Make-up exams will only be granted in cases of extreme surcomstances.
10. During exams and quizzes, hats must be removed or turned backwards and phones/pagers must be turned off and stored out of sight.
11. In the event that a student arrives late to an exam or quiz and one or more students have already completed the exam, the late student will not be allowed to take the exam and will receive a 0 for that exam.
12. Students must bring #2 pencils and a calculator to each exam and quiz. **No cell phone, PDA etc. calculators will be allowed.** I will not have any for you to borrow and you may not share calculators with others in the class.

### **Other important information**

Feedback & exam surveys: After the first 2 exams I will be asking you for feedback regarding this class. Please use this opportunity as it will help me to improve this class for you and future students. Please be as specific as possible in your comments. In addition, I encourage you to come by my office if you have questions, suggestions, or concerns regarding this class.

The Student Evaluation of Teaching Effectiveness (SETE) is a requirement for all organized classes at UNT. This short survey will be made available to you at the end of the semester, providing you a chance to comment on how this class is taught. I am very interested in the feedback I get from students, as I work to continually improve my teaching. I consider the SETE to be an important part of your participation in this class.

Classroom Behavior: Every student is expected to conduct themselves in a manner appropriate for an Institution of Higher Learning. Disruptive or degrading behavior will not be tolerated. See Code of Student Conduct for further details.

American with Disabilities Compliance: The Department of Kinesiology, Health Promotion, and Recreation does not discriminate on the basis of disability in the recruitment and admission of students, the recruitment and employment of faculty and staff, and the operation of any of its programs and activities, as specified by federal laws and regulations. The designated liaison for the department is Dr. Chwee Lye Chng, Physical Education Building, Room 209, 565-2651. Copies of the KHPR Department ADA Compliance policies are available in the Chair's Office, Physical Education Building, Room 209. Copies of the College of Education ADA Compliance Document are available in the Dean's Office, Mathews Hall 214. The student has the responsibility of informing the course instructor of any disabling conditions that will require modifications to avoid discrimination.

Academic Dishonesty: Cheating will not be tolerated in the class. You are not to receive information from another student or give information to another student during a test or quiz. You are to use only your memory. Students caught cheating during an examination or quiz will be charged under the University's Code of Student Conduct. Among other punishments, students found guilty run the risk of having their score changed to a zero, receiving a grade of F for the course, and/or dismissal from the University. Academic dishonesty includes cheating, plagiarism, fabrication, and facilitating academic dishonesty. Cheating refers to collaborating on individual assignments and using unauthorized materials. Plagiarism refers to presenting ideas, words, or statements of another person without giving credit to that person. If you have questions about cheating or plagiarism, please see me.

Family Educational Rights and Privacy Act (FERPA) Information: Students have the right to expect their grades will be kept confidential. There are a few things, because of the size and/or nature of this class, the instructor must advise you of regarding collection and distribution of test results, quiz scores, homework assignments, roll sheets, projects, etc. During this class it may be necessary for you to pass your assignments forward to the instructor or it may be necessary for the instructor to call your name and then return your completed assignment to you by passing it across the room. The instructor, under the reasonable assumption guidelines, assumes students are collecting only their own materials. Every attempt will be made to keep your information confidential. Neither your course grades nor grades for any assignment will be posted in a way that could result in your being identified by other students or faculty members.

UNT E-mail and Blackboard. All students should activate and regularly check their UNT-E-mail account and the Blackboard site for this class. A lot of class information will be distributed ONLY via these outlets. **DO NOT** send emails via blackboard as the instructor does not check emails on Blackboard.

**The instructor reserves the right to alter any portion of this syllabus.**