BMEN 3312 – Applied Biomechanics
Spring 2017

Instructor:
Dr. Rita M. Patterson
rita.patterson@unthsc.edu
(817) 735-2318
Office Hours: Tuesday before and after class or by appointment

Teaching Assistant:
Adegoke Folake

Class Schedule:
TTH 11:30 – 12:50
Tuesday room D215
Thursday room D215 – remote teleconference

Required Textbook:
Fundamentals of Biomechanics
ISBN 978-0-387-49311-4

COURSE DESCRIPTION
This course introduces the scientific basis of support and motion in humans drawing equally on
musculoskeletal biology and Newtonian mechanics. This course focuses on the effects of exercise,
training status, and ergogenic aids on exercise performance in regards to support and motion. This course
examines the fundamental concepts related to the qualitative assessment of human movement with an
emphasis on body structure, athletic performance, training and improvement, and mechanical overstresses
that result in injury. A variety of basic and applied topics are covered including: assessment and
modification of power, speed, strength, flexibility, body composition, and agility as well as current
strategies used to improve performance.

Catalog Course Description:
Introduction into the mechanics of deformable media in biomechanics, including biomaterials and
biological tissues with an emphasis in mechano-biology within the context of 1) kinematics 2) the concept
of stress, 3) equilibrium, 4) constitutive relations, and 5) boundary conditions.

Prerequisite(s): PHYS 1710, BMEN 2320

Course Objectives:
1. Gain an understanding of biomechanics
2. Determine the best design considerations for biomechanical systems
3. Determine the impact of hard and soft tissues on biomechanical function
4. Describe the relationship and interaction between force and motion.
5. Compare how body structure and composition affect whole body movement and performance.
6. Determine how the musculoskeletal system contributes to individuals’ speed, power, strength,
   flexibility, and agility.
7. Develop methods to improve performance based on biomechanical concepts, ergogenic aids, and the
   anatomical structure of an individual.
**ABET Criteria:**
BMEN 3312 addresses the following ABET program outcomes:
1. Apply knowledge of mathematics, engineering and science
2. Identify, formulate and solve engineering problems
3. Use techniques, skills and computer-based tools for conducting experiments and carrying out designs

**Grade Evaluation:**

<table>
<thead>
<tr>
<th>Component</th>
<th>Percentage</th>
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<tbody>
<tr>
<td>Exam 1</td>
<td>20%</td>
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<tr>
<td>Exam 2</td>
<td>20%</td>
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<tr>
<td>Journal Club assignment</td>
<td>15%</td>
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<tr>
<td>Homework, 2 @ 10% each</td>
<td>20%</td>
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<tr>
<td>Final TED Project</td>
<td>20%</td>
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<tr>
<td>Participation</td>
<td>5%</td>
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Extra Credit can add up to 2 points to your final score.

A – 90-100%
B – 80-89%
C – 70-79%
D – 60-69%
F - < 60%

Your grade will be determined numerically as indicated above. Grades will not be rounded up or down. Thus, any student with a final average of 79.99 will be awarded a C, a student with a 69.99 will be awarded a D, etc.

You have all of the information necessary to determine your grade at any time. Accordingly, there is no reason to ask the instructor for your grade. Grades will not be emailed.

**Tardiness during exams:**
If a student is tardy to class during an exam, they must arrive BEFORE the first exam is completed and turned in by another class member.

**Make-Up Exams:**
Make-up exams may be scheduled if notice of an absence is given prior to the examination time. The instructor reserves the right to require documentation verifying the reason for an absence (ex: doctors note). Make-up exams must be scheduled prior to the next lecture time.

**Re-Grade Policy:**
If the student believes a grade has been given in error, it is the student’s responsibility to ask for a re-grade of the work within 2 days of receiving the grade. The professor will re-grade the entire work and the student must accept either a higher or lower grade. After 2 days time the grade that is entered will be the final grade.

**Perceived Grading Errors:**
Write down the question number and the text reference that validates your answer. Bring that information to the instructor for review.
The instructor will adjust scores if a scoring error was made.
If the student is incorrect, the instructor will help the student relearn the material in question.
Attendance Policy:
It is the responsibility of each student to attend each lecture session for this course and to obtain and understand the material presented. The participation grade for this course is based on attendance and participation in journal club activities. In the event of an absence due to a University sponsored activity or an officially authorized absence the participation grade for that lecture will be waived. However, students attending a university-sponsored activity remain fully responsible for obtaining and learning the material. Any assignments due the day of the absence must be emailed to the instructor by the beginning of the class period. The lectures will be coordinated with the assigned readings. The text readings will provide students with a supplementary approach and perspective to the material. However, lectures will include information that is not covered within the text. Lecture packets will be available on Blackboard following each lecture.

Course Policies:
PROFESSIONALISM
Students are expected to arrive on time on lecture and laboratory days. Students are expected to be respectful and attentive during lectures offered by the instructor, visiting scientists, guest lecturers, or whoever may be leading a session. At all times, students are expected to act in a manner that does not interfere with the ability of the instructor to teach or fellow students to learn. Students are expected to be respectful and courteous to the instructor and fellow students.

Electronic Device Policy:
Cell phones, PDAs, laptops and other communication devices are to remain silenced throughout the lecture and laboratory sessions. Texting and/or emailing in class are not permitted. During course meeting times, students should not be texting, studying unrelated material, reading the newspaper, etc.

Students are responsible for checking UNT e-mail for messages from the university or from instructor or teaching assistant.

Class Preparation:
- Report to class on time and prepared. This includes reading and understanding the background readings.
- You are expected to be respectful and attentive during lectures offered by the Professor, visiting scientists, guest lecturers, or whomever may be leading a session.
- During course meeting times, you should not be attending to any material unrelated to the course content.
- At all times, you are expected to act in a manner that: 1) does not interfere with the ability of the instructor to teach or fellow to students to learn, and 2) is respectful and courteous to the instructor and fellow students.

Grading:
Questions regarding homework and course material should be directed to the instructor or the teaching assistant via email or verbally in class.

You SHOULD NOT email help questions you have done both of the following:
- Read and studied the lecture, text and assignment material
- Asked or discussed your question with at least one classmate
- Note: Final Exam material will be drawn from the material in the lectures and homework assignments.

Due Dates:
All assignments must be turned in at the times listed for that assignment. The score of a late assignment
will be reduced by 10% per day. Absence from class does not constitute notification of a late assignment. If an absence is unavoidable, the student is responsible for providing the assignment to the instructor on time. Computer/printer failures are not acceptable reasons for late assignments.

**Quality of Work:**
All written work must be printed legibly or typed. All logic and problem-solving steps must be shown for full credit.

**Disability Policy:**
All reasonable accommodation will be made to facilitate special needs. If special accommodations are required, the student must first meet with the staff of the Office of Disability Accommodation (ODA), Union Suite 322, (940) 565-4323. After meeting with that office, please contact me to discuss what accommodations will be necessary. For more information, see [http://www.unt.edu/oda](http://www.unt.edu/oda).