Musculoskeletal Functional Anatomy for Engineers
ME EN 7120 / BIO EN 6230

Lecture: Monday 11:50-1:45 pm (WEB L126)
Lab: Wednesday 12:55-3:55 pm (HPEB, 520 Wakara Way)

COURSE DIRECTORS:

<table>
<thead>
<tr>
<th></th>
<th>Office</th>
<th>Phone</th>
<th>E-mail</th>
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<tbody>
<tr>
<td>K. Bo Foreman, Ph.D., P.T.</td>
<td>HPEB 240</td>
<td>801-581-3496</td>
<td><a href="mailto:bo.foreman@hsc.utah.edu">bo.foreman@hsc.utah.edu</a></td>
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OFFICE HOURS: Foreman: by appointment

CREDITS: 3 semester credit hours

TEXTBOOKS:
Required: Any anatomy atlas (check half.com etc.). Good options include:
- Atlas of Anatomy, Gilroy, McPherson, Lawrence et al.
- Atlas of Human Anatomy, Frank H. Netter

A textbook is not required for the didactic portion of the course. All lecture handouts are available on Canvas for you to use electronically or print. I will also send a copy to the Copy Center so they can print them for you as needed. If you find a textbook is necessary, I would recommend:
- Gross Anatomy: The Big Picture (also available as an e-book through inkling), Morton, Foreman, Albertine

Available: Occupational Biomechanics (Chaffin, Andersson, and Martin); Biomechanics in Ergonomics (Kumar); Functional Anatomy of the Limbs and Back, (Hollinshead & Jenkins); Color Atlas of Anatomy (Rohen & Yokochi) and others. Copies of these texts are available in the Ergonomics and Safety library (MEB 2215) for use by enrolled students. These texts may be checked out for short periods of time.

Each dissection team will receive one copy of the lab manual to share between lab members during the semester. Additional copies are available electronically or can be printed from Canvas. If lost, a replacement fee will be charged to all members of your team.

Additional resources will be available on Canvas.

COURSE DESCRIPTION:
This course is intended to familiarize mechanical engineers and bioengineers with the structure and function of the human musculoskeletal and nervous systems. Lectures on Monday are followed on Wednesday by laboratory cadaver dissection dealing with the specific musculoskeletal structure discussed in the lecture. Topics include functional anatomy of the abdominal wall, abdomen, back, spine, arm, forearm, hand, thigh, leg, foot, and associated joints. Special emphasis
will be placed on ergonomic concerns, particularly to the distal upper extremity, shoulder, and low back.

Groups of four to five students will be assigned a cadaver that they will dissect during the course during the weekly three-hour lab periods.

**COURSE OBJECTIVES:**
Upon completion of this course, students will:
1. Become familiar with the human musculoskeletal and nervous systems, particularly the abdominal wall, abdomen, back, spine, arm, forearm, hand, thigh, leg, foot, and associated joints.
2. Develop basic skills in cadaver dissection.
3. Gain a rare perspective on muscle and joint function by observing the relative positions, sizes, and consistencies of actual muscles and bones.
4. Have a greater understanding and appreciation for how ergonomic risk factors affect various body tissues and biomechanical modeling.
5. Become familiar with modeling techniques.
6. Work in interdisciplinary teams to identify various nerves, muscles, bones, and joints of interest to engineers and ergonomists.

**EVALUATION OF STUDENT PERFORMANCE:**

<table>
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<tr>
<th>Evaluation Area</th>
<th>Score</th>
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<tr>
<td>Practical Exam 1 (“Tag Test”)</td>
<td>100</td>
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<tr>
<td>Written Exam 1</td>
<td>100</td>
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<tr>
<td>Practical Exam 2 (“Tag Test”)</td>
<td>100</td>
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<tr>
<td>Written Exam 2</td>
<td>100</td>
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<tr>
<td>Practical Exam 3 (“Tag Test”)</td>
<td>100</td>
</tr>
<tr>
<td>Written Exam 3</td>
<td>100</td>
</tr>
<tr>
<td>Quizzes (6 quizzes @ 10 pts, 1 drop)</td>
<td>50</td>
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Total: 650

Your cumulative score will be multiplied by 1.0 for full participation in laboratory sessions. Lack of participation will result in a lower cumulative score (i.e. multiplied by 0.9 or less depending on your amount of participation).

Grades will be determined on the standard scale in relation to your percentage out of the total 650 points, after multiplied by your participation score (A: 93-100%. A–: 90-93%, B+: 87-90%, B: 83-87%, etc.).

**Student Code**
All students are expected to maintain professional behavior in the classroom setting, according to the Student Code, spelled out in the Student Handbook. Students have specific rights in the classroom as detailed in Article III of the Code. The Code also specifies proscribed conduct (Article XI) that involves cheating on tests, plagiarism, and/or collusion, as well as fraud, theft, etc. Students should read the Code carefully and know they are responsible for the content.
According to Faculty Rules and Regulations, it is the faculty responsibility to enforce responsible classroom behaviors, beginning with verbal warnings and progressing to dismissal from class and a failing grade. Students have the right to appeal such action to the Student Behavior Committee. Students should read the Code carefully and know they are responsible for the content. http://regulations.utah.edu/academics/6-400.php

**Americans with Disabilities Act (ADA) Statement**

The University of Utah seeks to provide equal access to its programs, services and activities for people with disabilities. If you will need accommodations in the class, reasonable prior notice needs to be given to the Center for Disability Services, 162 Olpin Union Building, 581-5020 (V/TDD), http://disability.utah.edu/. CDS will work with you and the instructor to make arrangements for accommodations. All information in this course can be made available in alternative format with prior notification to the Center for Disability Services.

**Sexual Misconduct**

Title IX makes it clear that violence and harassment based on sex and gender (which includes sexual orientation and gender identity/expression) is a Civil Rights offense subject to the same kinds of accountability and the same kinds of support applied to offenses against other protected categories such as race, national origin, color, religion, age, status as a person with a disability, veteran's status or genetic information. If you or someone you know has been harassed or assaulted on the basis of your sex, including sexual orientation or gender identity/expression, you are encouraged to report it to the University’s Title IX Coordinator; Director, Office of Equal Opportunity and Affirmative Action, 135 Park Building, 801-581-8365, or to the Office of the Dean of Students, 270 Union Building, 801-581-7066. For support and confidential consultation, contact the Center for Student Wellness, 426 SSB, 801-581-7776. To report to police, contact the Department of Public Safety, 801-585-2677(COPS). Additional information regarding reporting and victim supportive resources are available at the offices listed above.

**Wellness Statement**

Personal concerns such as stress, anxiety, relationship difficulties, depression, cross-cultural differences, etc., can interfere with a student’s ability to succeed and thrive at the University of Utah. For helpful resources contact the Center for Student Wellness - www.wellness.utah.edu ; 801-581-7776.

**LGBT Resource Center**

If you are a member of the LGBTQ community, I want you to know that my classroom is a safe zone*. Additionally, please know that the U of Utah has an LGBT Resource Center on campus. They are located in Room 409 in the Olpin Union Building. Hours: M-F 8-5pm. You can visit their website to find more information about the support they can offer, a list of events through the center and links to additional resources: http://lgbt.utah.edu/. Please also let me know if there is any additional support you need in this class.