BMED 3400 Introduction to Biomechanics (Required)

Catalog Description: BMED 3400 Intro to Biomechanics (4-0-4)
Prerequisite(s): [MATH 2552 (w/ concurrency) OR MATH 2562 (w/ concurrency)] and COE 2001 (w/ minimum grade of “C”) An introduction to the basic concepts and methods in biomechanics, including statistics and the mechanics of biomaterials. The biomedical applications of mechanics will be illustrated.

Textbook: None

Prepared by: Cheng Zhu

Topics Covered:
1. Statics review
2. Mechanics of materials
3. Dynamics of rigid bodies

Course outcomes:
Students who complete this course will be able to:
Outcome 1: Draw free body diagrams and solve for forces and moments in a muscular skeletal system (Student Outcomes a and e)
Outcome 2: Obtain stress and strain distributions in bone and other simple structures under tension, compression, torsion, and bending (Student Outcomes a and e)
Outcome 3: Describe the mechanical properties of biological tissues (Student Outcomes a and e)
Outcome 4: Apply Newton’s laws to predict the motion of rigid particles (Student Outcomes a and e)
Outcome 5: Analyze the dynamics of rigid bodies and solve for velocities, acceleration, or forces (Student Outcomes a and e)
Outcome 6: Apply basic mechanics to biomedical engineering problems (Student Outcomes a and e)

Correlation between course outcomes and student outcomes:

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<tr>
<th>BMED 3400</th>
<th>Biomedical Engineering Student Outcomes</th>
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<td>Course outcomes</td>
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The Wallace H. Coulter Department of Biomedical Engineering Student Outcomes:

a. an ability to apply knowledge of mathematics, science, and engineering;
b. an ability to design and conduct experiments, as well as to analyze and interpret data;
c. an ability to design a system, component, or process to meet desired needs within realistic constraints such as economic, environmental, societal, political, ethical, health and safety, manufacturability, and sustainability;
d. an ability to function on multidisciplinary teams;
e. an ability to identify, formulate, and solve engineering problems;
f. an understanding of professional and ethical responsibility;
g. an ability to communicate effectively;
h. the broad education necessary to understand the impact of engineering solutions in a global, economic, environmental, and societal context;
i. a recognition of the need for, and an ability to engage in lifelong learning;
j. a knowledge of contemporary issues;
k. an ability to use the techniques, skills, and modern engineering tools necessary for engineering practice;