KIN 335—BIOMECHANICS
Fall 2006

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Prerequisites: BIO 201, MAT 170, PHY 111

Overview and Objectives:
The purpose of KIN 335 is to introduce Kinesiology students to concepts of mechanics as they apply to human movement, particularly those pertaining to exercise, sport, and physical activity. The student should gain an understanding of the mechanical and anatomical principles that govern human motion and develop the ability to link the structure of the human body with its function from a mechanical perspective. At the completion of this course it is desired that each student be able to: 1) describe motion with precise, well-defined mechanical and anatomical terminology, 2) understand and quantify linear and angular characteristics of motion, 3) understand the quantitative relationships between angular and linear motion characteristics of a rotating body, and 4) understand and quantify the cause and effect relationship between force and linear and angular motion.

The following items will be useful in completing this course: 1) a scientific calculator (with trigonometric functions), 2) a protractor (for measuring angles), and 3) graph paper.

Lectures are scheduled on MWF 9:40-10:30 AM. Labs are scheduled in four blocks on Wednesdays (7:40-9:30 AM, 11:40 AM-1:30 PM, 1:40-3:30 PM, or 3:40-5:30 PM). There will not be lab every week. Generally, on the weeks there are labs, there will not be a Wednesday lecture. In other words, you will generally have either lecture or lab (but not both) on any given Wednesday. Because labs depend on how we progress in lecture, I cannot give you an exact lab schedule at this time. I will try to give you at least two weeks notice for scheduled labs. Keep Wednesdays at 9:40 AM available, however. We will use these extra lecture times for help sessions, makeup sessions, etc. While attendance for lectures is not formally part of the course grading system, students are expected to attend all lectures and to arrive at class at or before the designated starting time. Late arrivals or early departures are very disruptive and are not appreciated. Attendance for labs is required and part of the grading system.

Course Content:
A detailed course outline with topics to be covered, reading assignments, and lab and exam schedules will be posted on the class web page separately. Schedules will be posted on the class web page approximately every two weeks. (Refer to the course outline for specific reading assignments related to the content shown in the schedule.) The order of presentation of the course material is as follows:

1. Introduction and Math Review (Basic definitions, algebra and trigonometry primer)
2. Anatomical Considerations (Planes and axes, joint actions, how muscles work)
3. Linear Kinematics (Describing how the body moves in a linear fashion [translation])
4. Angular Kinematics (Describing how the body moves in an angular fashion [rotation])
5. Linear Kinetics (Explaining how forces affect the body and its linear motion)
6. Angular Kinetics (Explaining how torques affect the body and its angular motion)
7. Fluid Mechanics (How the body and projected implements behave in air and water)
Textbook and Assigned Readings:

Required text (available in the ASU Bookstore and competing bookstores near campus):


Note: Additional supplemental readings may be assigned for labs and some lecture topics. Check the class web page for these readings. Reading assignments accompanying the lectures are noted in the topical outline distributed separately. Most laboratory reading assignments are identified in the laboratory handouts.

Grading Scheme:

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<tr>
<th>Assignment</th>
<th>Weighting</th>
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<tbody>
<tr>
<td>Exam 1 (approx. week 6 or 7)</td>
<td>24%</td>
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<tr>
<td>Exam 2 (approx. week 11 or 12)</td>
<td>24%</td>
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<tr>
<td>Final exam (Date and time: Monday December 11, 7:40-9:30 AM; Comprehensive: ~67% new material, ~33% old material)</td>
<td>36%</td>
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<tr>
<td>“Other” (Lab reports, quizzes, problem sets, and other written work)*</td>
<td>16%</td>
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*Late Penalties:* Written assignments will have specific due dates. A 5% deduction will be made for each 24 hours (beginning at the start of the class period on the due date) that an assignment is turned in late (note that Monday is considered one day later than Friday). Assignments that are not turned in to the instructor at the beginning of class may be turned in at the Kinesiology Department office (PEBE 107B) and must carry a Department stamp indicating the date and time the paper was received by one of the secretaries. *Neither missing class nor arriving late for class on the day an assignment is due prevents you from incurring a late penalty. Late submission of an assignment will not be accepted after that assignment has been graded and returned to students.*

Policy on Makeup Assignments and Quiz Retakes:

For whatever reason a student misses or does poorly on a written assignment or quiz, the student will have an opportunity to retake or makeup the assignment for up to 50% credit. This can be very important if the student’s grade is on the borderline. Students should come see Dr. Hinrichs during office hours to arrange for a retake or makeup, preferably within 1-2 weeks after receiving the low score. Students are encouraged to take advantage of this policy. The purpose of this policy is to help students master the material that was missed and to encourage students to interact more with their instructor. *There is no excuse for getting a zero on any assignment or quiz!*

Miscellaneous Notes:

On the class web page there are two files containing old example exams that are intended to show the kinds of questions (but not necessarily the content) contained in Dr. Hinrichs’ exams (multiple choice, short answer, problems). Answers to the multiple-choice portions of these example exams are posted on Dr. Hinrichs’ office door. Come see Dr. Hinrichs for solutions to the short answer and problem portions of these example exams. Check the class web page for additional information and resources.