ENGINEERING METHODS FOR BIOLOGICAL SYSTEMS
BSEN 2210

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1. Credit Hours: 1 lecture hour/week, 3 Lab hours/week; Total of 2 credit hours for 15 weeks

Prerequisite: ENGR 1110, PHYS 1600 or departmental approval

2. Text/Major Resources

3. Course Description:
   This course will give students the background in communication and computational skills necessary for engineering practice for biological systems. Students will be presented a survey of computational methods for solving common problems in biosystems engineering. Students will gain a working knowledge of specific software packages with which to implement the methods. Topics covered will include geometric modeling (CAD) and finite element analysis, general introduction to GIS, site design and surveying, data analysis with spreadsheets, use of macros in spreadsheets, programming and problem solving with Matlab, and other software as time permits; laboratory and shop safety; resume writing, technical writing.

4. Course Objectives:
   Engineering students are required to complete courses covering the fundamentals of engineering before moving into discipline-specific studies. These fundamental classes are taught from a theoretical standpoint in as broad a context as possible. This class is intended to cover engineering fundamentals from a biosystems engineering perspective and provide students with skills necessary to solve complex engineering design problems.

   The specific objectives of the course are:

   (a) Become familiar with software applications that are used throughout the curriculum in Biosystems Engineering.
   (b) Present the fundamentals of fluid dynamics, thermodynamics, and structural design from a biosystems engineering perspective.
   (c) Expose students to the engineering properties of biological systems.

5. Course Content and Schedule:

<table>
<thead>
<tr>
<th>Lecture No.</th>
<th>Topic</th>
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<tbody>
<tr>
<td>1 – 2</td>
<td>Programming concepts</td>
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<tr>
<td>3 – 4</td>
<td>Excel programming</td>
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<td>5</td>
<td>Test 1</td>
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<td>6</td>
<td>Matlab</td>
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<tr>
<td>7 – 8</td>
<td>Modeling of biological systems</td>
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6. Course Requirements/Evaluation

The grade for the course will be determined from the two in-class tests, homework, lab reports, and the final exam. None of the tests will be comprehensive. These tests, or portions of them, may or may not be open book - open notes. The course grade will be determined as follows:

- Average of 2 tests and final exam: 40%
- Average of Homework sets: 20%
- Average of Lab reports: 40%
- TOTAL: 100%

7. Course Policy Statements:

Class attendance is at the discretion of the student. Whether class and/or labs are attended does not relieve the student of responsibility. All covered material including tests, handouts lecture material, and homework are due when stated regardless of whether the student is present or not. Exceptions will be made for documented absences such as illness, family deaths, etc.

Class atmosphere will be informal and questions are generally welcomed at any time. You are welcome to visit the office at any time whether or not you have made an appointment in advance. If you are having trouble understanding the material, please come see me, as I cannot answer your questions unless you ask them. All work turned in must be neat and orderly. The use of engineering paper and some type of binder is expected for laboratory reports and homework. Use only one side of the paper. Write clearly and neatly. I cannot and will not grade what I cannot read.

Students are expected to adhere to the Auburn University Oath of Honor listed below. Additional info about academic honest policy can be found in the current Tiger Cub Student Handbook, Code of Laws (www.auburn.edu/tigerclub). Plagiarism or any other form of academic misconduct will not be
tolerated and will be punished to the fullest extent. Specifically, the contents of assignments, laboratory reports, term papers, quizzes, and examinations will be solely that of the student unless otherwise appropriately cites. In addition, students cannot use any notes, materials, or aids (including previous reports) except those permitted by the instructor.

**Oath of Honor:** “In Accordance with those virtues of Honesty and Truthfulness set forth in the Auburn Creed, I, as a student and fellow member of the Auburn Family, do hereby pledge that all work is my own, achieved through personal merit and without any unauthorized aid. In the promotion of integrity, and for the betterment of Auburn, I give honor to this, my oath and obligation.”

([www.auburn.edu/sga/oath/code](http://www.auburn.edu/sga/oath/code)).

Students needing special accommodations are strongly encouraged to meet with the instructor as soon as possible to discuss the Accommodation Memo. Students that need special accommodations but do not have an Accommodations Memo are encouraged to contact the Program for Students with Disabilities in 1244 Haley Center