

SOUTHERN POLYTECHNIC STATE UNIVERSITY
DEPARTMENT OF SYSTEMS AND MECHANICAL ENGINEERING
COURSE SYLLABUS

SPECIAL TOPICS: BIOMECHANICS

Semester: Fall 2014
Instructor: Dr. M. Loraine Lowder
Course number: ME 3903
Course registration number: 1336

Course Start Date: Thursday, August 14th
Room Number: Q106
Meeting Days: TR
Meeting Times: 1:00 PM – 2:15 PM

Instructor Contact Information:

Office: G171
Telephone: (678)915-3425
Email: llowder@spsu.edu
Office Hours:
Tuesday & Thursday: 9:45 AM – 10:15 AM in Q326
Tuesday & Thursday: 2:20 PM – 4:20 PM in G171
(Additional Office Hours are Available by Appointment)

Credit Hours: 3

Prerequisite(s): ENGR 2214: Statics

The Instructor may remove a student at any time during the term if it is noted that these requirements have not been met. The student will receive a W or F as appropriate.

Course Description

This course will provide an introduction to the structural and mechanical behavior of biological tissues and systems by building on the concepts of Statics, Dynamics, and Strength of Materials.

Required Textbooks and Additional Materials

Text: *Fundamentals of Biomechanics: Equilibrium, Motion, and Deformation*, 3rd Edition (2012), Ozkaya, Nordin, Goldsheyder, and Leger □
Recommended Text: *Basic Biomechanics*, 6th Edition (2012), Hall
Essentials: Scientific Calculator, Engineering Paper

Learning Outcomes:

1. Understand basic human anatomy and physiology
2. Understand human body statics, kinematics, and dynamics and use these concepts to solve biomechanics problems
3. Describe the mechanical properties of biological tissues
4. Analyze stress and strain distributions in biological tissues

Course Topics:

1. Force Vectors
2. Moment And Torque Vectors
3. Statics: Systems in Equilibrium
4. Applications of Statics to Biomechanics
5. Introduction to Dynamics
6. Linear Kinematics & Kinetics
7. Angular Kinematics & Kinetics
8. Impulse and Momentum
9. Introduction to Deformable Body Mechanics
10. Stress & Strain
11. Multiaxial Deformations & Stress Analyses
12. Mechanical Properties of Biological Tissues

This list is tentative and may be revised.

Important Dates

Holiday: Thursday, November 27th

Last Day to Withdraw: Thursday, October 2nd

Last Day of Classes: Monday, December 1st

Commencement: Saturday, December 13th

All Grades Posted: Monday, December 15th

ADA Compliance Statement

If you have a documented disability as described by the Rehabilitation Act of 1973 and the Americans with Disabilities Act (ADA) that may require you to need assistance attaining accessibility to instructional content to meet course requirements, we recommend that you contact the ATTIC at (678)915-7361 as soon as possible. It is then your responsibility to contact and meet with your instructor. The ATTIC can assist you and the instructor in formulating a reasonable accommodation plan and provide support in developing appropriate accommodations for your disability. Course requirements will not be waived but accommodations will be made, when appropriate, to assist you to meet the requirements.

Course Delivery Method

This course will use a variety of instructional strategies and techniques including, but not limited to, face-to-face lectures, demonstrations, problem solving sessions, and small group discussions. Some lecture sessions may be replaced by assignments (such as research on special topics on engineering materials), videos, industrial tours or professional lectures, all of which are aimed at providing the students with a broader, contemporary knowledge of engineering.

Class Policies:

Attendance Policy:

- Students are expected to attend every class and be on time. Students are responsible for material covered in class, as well as all assignments, even if they are absent or tardy. Tardiness to (or leaving early from) two classes is considered one unexcused absence. Five unexcused absences may result in a student's final course grade being lowered by one full letter grade.
- Excused absences require documentation:

Reason	Required Documentation
Illness	Original hard copy of doctor's excuse on letterhead
Death in the family	Obituary or death certificate
Sponsored SPSU event	Program with student's name printed on it

Make-up Policy:

- Assignments are due at the BEGINNING of class on the due date. Late assignments will **not** be accepted except in the case of an excused absence.
- Make-up assessments will **not** be allowed except in the case of an excused absence.

Emergency Policies:

- In the event of an emergency that forces the college to close for an extended period, students must contact the instructor of this class within 48 hours using the contact information (e.g., email address, or Desire2Learn) on the syllabus to obtain directions for continuing the course. The instructor will provide directions for the transmission and submission of course assignments and course assessments, including due dates.
- If the instructor for the course cannot be reached within the specified period of time (within 2 business days), the chair of the department responsible for the course can be reached at the email address posted on the university's website.

Academic Honesty:

- Consistent with the university's policy, cheating of any kind on **any** assignment will not be tolerated and will be punished by academic and/or disciplinary sanctions. Cheating will result in severe penalties including a zero for the assignment, failure in the course, and/or expulsion.

Honor Code information and provisions are available at:

<http://www.spsu.edu/honorcode/>

Methods of Assessment:

- **Exams**
There will be THREE EXAMS. Each exam will cover the material presented in the lecture, reading assignments, and homework assignments.
- **Quizzes**
There will be FOUR QUIZZES.
- **Homework**
Homework will be assigned for the purpose of strengthening of the concepts covered in lectures. While students are expected to complete all of the problems that have been assigned, only select homework problems will be collected and graded.
- **Final Exam**
THE FINAL EXAMINATION WILL BE COMPREHENSIVE.

Evaluation:

Your grade will be assigned on the following basis of an overall score, derived as follows:

Three Exams:	40%	Homework:	15%
Four Quizzes	25%	Final Exam:	20%

Letter grades will be awarded using the following guidelines:

A	90 – 100%	D	60 – 69%
B	80 – 89%	F	59% or below
C	70 – 79%		

Problems related to grading should be first brought to the attention of the professor for the course. However, a resolution of unsettled problems or concerns may be pursued by following the procedures outlined in the SPSU Catalog.

Course Schedule:

Week	Day	Date	Topic	Quiz/Exam
1	Thursday	8/14/2014	Chapter 1	
2	Tuesday	8/19/2014	Chapters 2 – 3	
2	Thursday	8/21/2014	Chapter 4	Quiz 1
3	Tuesday	8/26/2014	Chapter 5	
3	Thursday	8/28/2014	Chapter 5	
4	Tuesday	9/2/2014	Chapter 5	
4	Thursday	9/4/2014		Exam 1
5	Tuesday	9/9/2014	Chapter 6	
5	Thursday	9/11/2014	Chapter 6	
6	Tuesday	9/16/2014	Chapter 7	
6	Thursday	9/18/2014	Chapter 7	Quiz 2
7	Tuesday	9/23/2014	Chapter 8	
7	Thursday	9/25/2014	Chapter 8	
8	Tuesday	9/30/2014	Chapter 9	
8	Thursday	10/2/2014		Exam 2
9	Tuesday	10/7/2014	Chapter 9	
9	Thursday	10/9/2014	Chapter 10	
10	Tuesday	10/14/2014	Chapter 10	
10	Thursday	10/16/2014	Chapter 11	Quiz 2
11	Tuesday	10/21/2014	Chapter 11	
11	Thursday	10/23/2014	Chapter 12	
12	Tuesday	10/28/2014	Chapter 13	
12	Thursday	10/30/2014		Exam 3
13	Tuesday	11/4/2014	Chapter 13	
13	Thursday	11/6/2014	Chapter 13	
14	Tuesday	11/11/2014	Chapter 14	
14	Thursday	11/13/2014	Chapter 14	Quiz 4
15	Tuesday	11/18/2014	Chapter 14	
15	Thursday	11/20/2014	Chapter 15	
16	Tuesday	11/25/2014	Chapter 15	
16	Thursday	11/27/2014	Thanksgiving Holiday	

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