ME/BE523 Mechanics of Biomaterials Spring 2009

Departments of Mechanical and Biomedical Engineering, Boston University

Instructor: Professor Catherine Klapperich; **Office:** 725, 44 Cummington St., **Office Hours:** Wed.12-2p, catherin@bu.edu

Grading: Exams (2): 30%, Homeworks: 35%, Final Project: 35%.

Textbook: N. Dowling, Mechanical Behavior of Materials, 3rd edition.

Prerequisites by topic: EK 301, EK 305 or BE 420

Date	Lecture	Topic	Notes (Readings, events)
Th Jan 15	1	Overview of course, Introduction to Materials in Medicine / Logistics	Dowling Chapters 1 and 2
Tu Jan 20	2	Cells, Tissue Types and Relevant Anatomy; Foreign Body Response	***Class will start late*** *- when the Inauguration Speech ends!* Handouts
Th Jan 22	3	Materials Classes, Metals, Ceramics	Dowling Chapter 3
Tu Jan 27	4	Deformation of an Elastic Solid	Dowling Chapter 4.1-4.6,4.9
Th Jan 29	5	Complex and Principal States of Stress and Strain	Dowling Chapter 5.3, 5.4
Tu Feb 3	6	Review of Beam Theory	Dowling Appendix A
Th Feb 5	7	***Guest Lecture:*** Dr. Satish Singh, Endoscopy Tools	No reading
T Feb 10	8	Materials Classes, Polymers, Materials Selection	**CIMIT Forum 4-6pm** *Their Research Center*
Th Feb 12	9	Introduction to the Mechanics of Soft Materials; Creep, Stress Relaxation, *Exam Review*	Dowling 5.2 Dowling 15.1-15.3
Tu Feb 17		**No Class – MONDAY classes.**	**CIMIT Forum 4-6pm** *Shapiro Cardiovascular Center*
Th Feb 19	10	**Midterm #1**	
Tu Feb 24	11	Linear Viscoelasticity	**CIMIT Forum 4-6pm** *Simulation and Skills Center*
Th Feb 26	12	Linear Viscoelasticity	Handouts
Tu March 3	13	Measuring Viscoelastic Behavior	Handouts
Th March 5	14	Nanoindentation of Biomaterials and Tissues	Handouts
Tu March 10		**No Class – Spring Break**	No reading
Th March 12		**No Class – Spring Break**	No reading
Tu March 24	15	FDA Approval Process; Quality Control Issues for Medical Materials	Handouts
Th March 26	16	Yielding Failure	Dowling Chapter 7
Tu March 31	17	Fracture Failure	Dowling Chapter 8
Th April 2	18	Fracture Failure	Dowling Chapter 8
Tu April 7	19	Fatigue	Dowling Chapter 9.1-9.6
Th April 9	20	Sterilization Technology and Shelf Life Considerations: Effects on Device Performance	Handouts
Tu April 14	21	Manufacturing Solid Polymers; *Exam Review*	Handouts
Th April 16	22	**Midterm #2**	
Tu April 21	23	Manufacturing Solid Polymers	No reading
Th April 23		**No Class – MONDAY classes.**	
Tu April 28	24	Ethics, Regulations, and Future Societal Challenges	Handouts
Th April 30	25	**Project Presentations Poster Session**	

**There will be no make-up exams. For the first missed exam, grades will be based on the remaining quizzes. For a second missed exam, a grade of zero will be given.

***Homework is due at the beginning of class and will not be accepted late (ever). Missed/late homework will result in a zero. Plagiarism of any kind will not be tolerated.