ENGG 3170 COURSE OUTLINE– BIOMATERIALS
Fall Semester 2007

Instructor Information

Instructor: Zoryana Salo, Rm 306 Thornborough Building, Email: zsalo@uoguelph.ca

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Website: Through University of Guelph course link (Web CT) webpage.

Course Description and Scheduling

Lecture Times: M,W,F – 11:30-12:20, MACK 223

Lab Times: T, W - 2:30 - 4:20, Room 2196, Thornbrough Building.

Text: There is not an assigned textbook associated with this course. I will be using the University of Guelph Course link (WebCT) webpage to communicate with the class. You will automatically gain access to the course web page when you register for the course. Lecture notes will be posted on WebCT before each lecture. The notes are not complete on their own, and it is still highly encouraged that you attend lectures to receive the full course notes.

Recommended Texts for reference (Available on reserve at the University of Guelph Library):
Biomaterials Science – An Introduction to Materials in Medicine – Buddy Ratner, Alan Hoffman, F. Schoen and J. Lemons, Elsevier Academic Press, CA, 1996 (1st edition), and 2004 (2nd edtition).

Marking Assignments
Marks will be assigned based on four experimental labs (weighted at 20%), three assignments (10%), one group project (10%), and a combination of the midterm and final (60%). The midterm will be weighted at 20% and the final at 40% of your final grade. In the event that a student wishes their final exam to be worth the full 60% of the grade (*i.e.* missed or failed midterm exam), this will be considered under personal consultation with the instructor. Laboratory reports are due the following Friday after completing the lab, and assignments will be due the following Friday after they are handed out – penalties for lateness (10% per day) will be applied.

Tentative Lecture Schedule

Topic	Lecture No. (Approximate Dates)
Introduction and Overview	**1 (September 10)**
Review of Basic Materials Science Concepts with biological applications – atoms and chemical bonding, stress, strain, tensile and compressive testing, hardness, toughness, fatigue, elasticity and viscoelasticity, thermal properties, surface properties	**2 – 7 (September 12 – 24)**
Conventional Replacements for Biological materials **Including: Metals** **Polymers** **Ceramics** **Composites**	 **8 (September 26)** **9 (September 28)** **10 (October 1)** **11 (October 3)**
Catch up and Review for Midterm **Midterm Examination (5:30 – 7:00, MACK 227)**	**12 – 13 (October 5 – 10)** **(October 16)**
Biological materials **Including: Basics of biological tissue** **Bone** **Cartilage** **Soft-tissue**	 **14 (October 12)** **15 - 16 (October 15 - 17)** **17 – 18 (October 19 – 22)** **19 – 20 (October 24 – 26)**
Alternative Biologic replacements – tissue engineering **Material Response: Corrosion** **Material Response: Wear**	**21 (October 29)** **22 – 23 (Oct. 31 – Nov. 2)** **24 – 25 (November 5 – 7)**
Cell Response: Engineering Aspects	**26 – 27 (November 9 – 12)**
Cell Response: Inflammation and Infection	**28 – 29 (November 14 – 16)**
Testing Methods of Biologic Performance and Ethics	**30 – 31 (November 19 – 21)**
Project Presentations	**32 – 34 (November 23 – 28)**
Review	**35 (November 30)**

Laboratory Experiments

Labs will begin the forth week in October, and end the week of November 12. Four laboratory experiments are planned as follows:

1. Tensile test of dental material.
2. Anisotropy - Compressive test of bone.
3. Determining Poisson's Ratio of Cartilage.
4. Finite element analysis of bone.

University Policy on Academic Misconduct

Academic misconduct, such as plagiarism, is a serious offence at the University of Guelph. Please consult the Undergraduate Calendar 2003-2004 and School of

Engineering programs guide, for offences, penalties and procedures relating to academic misconduct. http://www.uoguelph.ca/undergrad_calendar/08-amisconduct.shtml