

## MSE 52700-Biomaterials

**Instructor:** Lia Stanciu

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**Lecture:** TTh 1.30-2.45pm, WANG2555

**Office Hours:** open door, ARMS 2223

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**TA:** Li-Kai Lin

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**Required Textbook:** Joon Park, R.S. Lakes: Biomaterials: An Introduction.

Exam dates: Exam1: February 6

Exam 2: March 8

Exam 3: April 22

### Course Goal

This course is designed to provide a foundation of knowledge of biomaterial science principles. The course presents a balanced perspective on the evolving discipline of Biomaterials Science by including information on hard biomaterials and soft biomaterials, orthopedic ideas, cardiovascular concepts, ophthalmologic ideas, and dental issues. The course will include a balance of fundamental biological concepts, materials science background, medical/clinical concerns, as well as a coverage of biomaterials past, present, and future. The aim of the course is for the student to gain a solid appreciation for the special significance of the word biomaterial as well as the rapid and exciting evolution and expansion of biomaterials science and its applications in medicine. At the end of the semester, all students should identify and understand the main terms largely used in biomaterials literature, basic properties of various biomaterials, correctly associate terms with processes/phenomena, and be able to correlate related events. Examples:

- Biocompatibility and bioavailability.
- Characterization techniques
- Thrombosis and the clotting cascade
- Foreign body response.
- Performance requirements for metals, ceramics and polymers used as biomaterials.
- Discussions of current topics in biomedical research, based on the latest scientific literature and case studies will occur every few lectures.

### Exams

There will be three exams given over the course of the semester. Their content will be based on lectures and handout material.

### Grading

**Exam 1: 30%, Exam 2: 30%, Exam 3: 30%, Participation: 10%**

90% = A, 80% = B, 70% = C, 60%= D

Spring Semester, 2018

<b>Selected Topics</b>
Introductory lecture
Metals I
Metals II
Ceramics I
Ceramics II
Polymers I
Polymers II
Hard Tissues I
Hard Tissues II
Orthopedic Soft Tissues I
Orthopedic Soft Tissues II
Other Soft Tissues
Inflammatory Response/Foreign Body Response
Surface Chemistry
Surface Characterization I
Surface Characterization II
FDA and Patent Law
Current Topics in Biomaterials Research

## **Campus Emergency and Academic Dishonesty Information**

### **I. Campus Emergency Policy**

In the event of a major campus emergency, course requirements, deadlines and grading percentages are subject to changes that may be necessitated by a revised semester calendar or other circumstances. Any such changes will be posted to the course website on *Blackboard Vista*. If you are unable to use Blackboard from home please let us know early in the semester so we can make other arrangements for your special needs.

*Use of cell phones and similar devices, including texting, is strongly discouraged during class. However, please make sure that such devices are set to silent or vibrate mode in order to be informed in case of a campus emergency. If you receive a message indicating an emergency, please communicate Purdue's announcement to the class.*

### **II. General Statement on Academic Dishonesty**

Purdue University Regulations, Part 5, Section III-B-2-a describes the formal policies governing academic dishonesty. Purdue prohibits "dishonesty in connection with any University activity. Cheating, plagiarism, or knowingly furnishing false information to the University are examples of dishonesty." A guide providing specific examples, tips, and consequences is available from the Office of the Dean of Students at:

<http://www.purdue.edu/odos/osrr/academicintegritybrochure.php> .

As discussed in this brochure on *Academic Integrity*, there are many dishonest ways to gain an advantage over another student in an assignment. The goal is not to list these here, but these rules cover any assignment for which the instructor will assign a grade (homework, quizzes, exams, laboratory reports, term paper, etc.). Rather, students should ask themselves this question when working on all class assignments: "*If I use this information, will the completed assignment represent only my efforts?*" If the answer is no, then don't do it. The test is simple. For example, turning in a term paper obtained from a website does not represent your efforts. Turning in copied homework from another student or solutions manual does not represent your efforts either.

### **III. Specific Statement on Academic Dishonesty For MSE597M/BME583**

**Quizzes and Exams in:** Cheating on quizzes or exams is a very serious offense. This includes any low-tech (copying off a nearby student's paper, hidden crib sheet, etc.) or high-tech (using email, calculator storage, etc.) approach, or modification of an exam after it has been returned. There is never a time when copying from another's quiz or exam is acceptable.

### **IV. Consequences of Academic Dishonesty**

The teaching staff for this course will diligently monitor academic dishonesty in all assignments. Students found to engage in academic dishonesty are subject to discipline to potentially include: a grade of zero for the assignment, a grade of F for

the course, a permanent letter added to your file, and reporting the incident to the Dean of Students for further action. Two letters in your file will result in an automatic forwarding of the case to the Dean of Students.

Please note that students who share their prior assignments with students currently enrolled in the course can also be disciplined.