

**BMEN 5321 – Biomaterials Compatibility  
Fall 2019**

**Instructor:**

Dr. Melanie Ecker

940-369-8998

Office: K240C

Office Hours: Monday and Wednesday 2:30 –3:30 PM, or by appointment

**Class Schedule:**

Monday, Wednesday 4:00 – 5:50 PM

**Required Textbooks:**

Buddy D. Ratner, et al. Biomaterials Science, 3rd edition, ISBN 9780123746269.

**Catalog Course Description:**

Relevance of mechanical and physical properties to implant selection and design; effect of the body environment on metallic, ceramic and plastic materials; tissue engineering; rejection mechanisms used by the body to maintain homeostasis regulatory requirements.

Prerequisite(s): Graduate standing or consent of instructor.

**Course Objectives:**

The course will teach the principles of biomaterials used for tissue engineering and for biomedical devices to students so they may perform interdisciplinary research in the area of materials for biomedical problems. Research is becoming more cross-disciplinary and this course will help student get familiar with how to use engineering approaches to study biomaterials and their interaction with cells and tissues. The three principal course goals are 1) to learn basic tissue structures and their functions, 2) to learn about different materials that can be used as biomaterials, and 3) to learn the experimental tools used to understand tissue functions, interactions between materials and tissues, and the assessment of their compatibility.

**Brief list of topics**

Biomaterials introduction

Metals

Ceramics

Polymers

Material characterization

Biocompatibility

Biocompatibility testing

Special topics in biomaterials compatibility

**Attendance and academic performance:**

- 1) Regular and punctual class attendance is expected.
- 2) Students are expected to read materials assigned thoroughly and search related literatures using PubMed, Web of Science, or Google Scholar.
- 3) Students are expected to answer questions and discuss the topics related to the course materials in the classroom.
- 4) Homework consist of three written research paper discussions. The papers to be discussed will be given by the instructor. Students are expected to turn in homework by the due date. Late homework sets will not be accepted.
- 5) Presentations of Special Topics will be throughout the semester. Presentations are expected to be 20 minutes and to cover a topic relevant to the course. Students may pick their own topic but must discuss it with the instructor during office hours.

**Grade Evaluation:**

Class Participation and Discussion: 20%

Homework @ 20% (Paper Discussion): 60%

Presentation @ 20% (Special Topic): 20%

A – 90-100%

B – 80-89%

C – 70-79%

D – 60-69%

F - < 60%

**Disability Policy:**

All reasonable accommodation will be made to facilitate special needs. If special accommodations are required, the student must first meet with the staff of the Office of Disability Accommodation (ODA), Union Suite 322, (940) 565-4323. After meeting with that office, please contact me to discuss what accommodations will be necessary. For more information, see <http://www.unt.edu/oda>.