

BME213e Biomaterials

Level: 2

Credit Units: 5 Credit Units

Language: ENGLISH

Presentation Pattern: EVERY JAN

E-Learning: BLENDED - Learning is done MAINLY online using interactive study materials in Canvas. Students receive guidance and support from online instructors via discussion forums and emails. This is supplemented with SOME face-to-face sessions. If the course has an exam component, this will be administered on-campus.

Synopsis:

The course aims to provide students with a general understanding of a wide range of biomaterials made from appropriate metals, ceramics, and polymers (including natural and synthetic polymers). Included in the course are many relevant fundamental details that link factors such as bonding, structure, processing parameters and microstructures to the properties of biomaterials. These fundamentals will equip students to understand the mechanical, chemical and physical behaviour of materials when used in biomedical applications.

Topics:

- Introduction to Biomaterials
- Properties of Biomaterials
- Polymeric Biomaterials
- Metallic Biomaterials
- Ceramics and Glass Ceramic Biomaterials
- Composite Biomaterials

Textbooks:

Buddy D. Ratner, Allan S. Hoffman, Frederick J. Schoen and Jack E. Lemons (Eds).: Set Textbook: Biomaterials Science: An Introduction to materials in Medicine, 4th Elsevier Academic Press, ISBN-13: 9780128161371

Learning Outcome:

- Describe materials according to their property sets
- Explain the nature of the primary bonds common to many materials
- Illustrate the different structures common to the different classes of materials
- Categorize the properties of the different class of materials
- Examine the specific properties of a key set of biomaterials
- Distinguish the different materials required for various medical devices by using their knowledge on materials properties.
- Demonstrate the use of biomaterials in a range of biomedical applications
- Analyze and interpret data from various characterization systems through laboratory sessions.

Assessment Strategies (Evening Class):

Components	Description	Weightage Allocation (%)
Overall Continuous Assessment	PRE-CLASS QUIZ 1	2
	PRE-CLASS QUIZ 2	2
	PRE-CLASS QUIZ 3	2
	QUIZ 1	12
	QUIZ 2	12
Overall Examinable Components	Written Exam	70
Total		100