

BME304e Advanced Biomaterials

Level: 3

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:

This course builds up from BME213, with advanced topics in biomaterials science through studies on biodegradation, biocompatibility, experimental methods to characterise biomaterials. Finally some case studies are discussed followed by studies on the influence of biomaterials on implant devices.

Topics:

- Degradation of Materials in the Biological Environment
- Biocompatibility and Related Issues
- Testing of Biomaterials
- Biomaterials Case Studies (Soft Tissues)
- Biomaterials Case Studies (Hard Tissues)
- Implant Devices and 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 Elsevier Academic Press
ISBN-13: 9780123746269

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Learning Outcome:

- Demonstrate knowledge on biodegradation in biomaterials devices and application.
- Examine biocompatibility issues in biomaterials devices and applications.
- Illustrate an advanced understanding on the variety of biomaterials based on metals, ceramics, polymers (including natural and synthetic polymers).
- Analyze materials properties and relate them to application.
- Design an experiment to perform mechanical testing in order to obtain basic physical properties of biomaterials
- Propose suitable implant devices, scaffolds, etc from biomaterials using knowledge gained.

Assessment Strategies:

Continuous Assessment Component	Weightage (%)
QUIZ	12
QUIZ	12
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
PRE-CLASS QUIZ	2
Sub-Total	30

Examinable Component	Weightage (%)
Written Exam	70
Sub-Total	70

Weightage Total **100**