Technical-Elective
Biomaterials II: Tissue Engineering
Spring 2022

CATALOGUE DESCRIPTION

Essential role of all artificial biomaterial implants, three generations of biomaterials, principle of tissue engineering, alternative solution, eleven organ systems, the most threatening human diseases in these systems, tissue engineering protocols using biomaterials, technical standards and legal regulations on biomaterials and tissue engineering, four phases of clinical trials.

Mode of Delivery	On campus
Workload	3 hours of lectures/tutorials and 8 hours of private study per week.
Prerequisites	ENGR 0022
Campus:	Zone 4-201
Instructor:	Grace Chen
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Teaching Assistant	Miss Lyn Li
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ACADEMIC OVERVIEW

Learning Objectives

Upon successful completion of this course, the students will be able to:

1. Understand the principle of tissue engineering
2. Understand some techniques used in tissue engineering including methods of scaffold manufacture.
3. Appreciate basic medical concepts and be able to communicate effectively with the medical community
4. Have a basic understanding of the human anatomy, and be aware of the most threatening human diseases of global population
5. Appreciate the approach of tissue engineering as an alternative solution
6. Understand regulations and ethical responsibilities in the process of developing biomaterials, medical devices, and tissue engineering protocols
7. Be able to review a journal article and provide a detailed assessment.

Teaching and Learning Methods

The unit consists of lectures and problem classes. Learning in the unit is mainly through attending the lectures, problem classes and completing the assignments and group presentations.

Grading Policy

Assessment Task	Value
1. Attendance and Answer questions in class	10 %
2. Homework	30 %
3. Mid-semester examination	30 %
4. Group Presentations	30 %

The Instructor reserves the right to moderate the assessment policy. This process may occur at the end of the semester.

RECOMMENDED TEXTBOOKS AND READINGS

On Biomaterials:

1. Biomaterials: A Basic Introduction. By Qizhi Chen and George Thouas.
2. Biomaterials Science: An Introduction to Materials in Medicine. Ed: Buddy D Ratner, Allan S Hoffman, Frederick J. Schoen, Jack E. Lemons. 2nd ed. Elsevier Academic Press, c2004.

On Tissue Engineering:

3. Principles of Tissue Engineering, R.P. Lanza, R. Langer, and J.P. Vacanti, Editors. 2000, Academic Press: California.

On Anatomy and Histology

4. **Excellent websites:**
   http://www.innerbody.com/htm/body.html (Excellent illustrations)
   http://www.free-ed.net/free-ed/HealthCare/Anatomy/default.asp (concise)

On Evaluation and Regulation

5. Hand Book of Biomaterials Evaluation. AF von Recum (editor). 2nd ed. Scientific, technical, and clinical testing of implant materials. c1999.
6. http://www.fda.gov/ U.S Food and Drug Administration:
   http://www.iso.org/iso/home.htm International Organization for Standardization (ISO)

Prepared by: Grace Qizhi Chen Date: 13 February 2022