San José State University
School of Engineering/ Biomedical Engineering BME 288, Tissue Engineering, Spring 2020

Course and Contact Information

Instructor: Ashkan Aryaei

Office Location: Department Conference Room

Telephone: NA

Email: ashkan.aryaei@sjsu.edu

Office Hours: TBA

Class Days/Time: Thursdays- 6:00 pm- 8:45 pm

Classroom: CL 302

Prerequisites: Graduate Standing

Course Format

Technology Intensive, Hybrid, and Online Courses

This is not an online course, however, an interactive approach is followed in the class and students are highly recommended to bring their laptop/tablet for research during lecture.

Course Description

This course strikes a balance among the diversity of subjects that are related to tissue engineering including biology, chemistry, material science, and engineering among others, while also emphasizing those research areas that are likely to be of clinical value for engineering new organ systems. This course will partially explain the available tissue engineering products in market for treating different diseases. In addition, this course seeks to improve the team work, presentation, and communication skills through the course team presentation.

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

1. Understand and explain fundamentals of tissue engineering and its application.
2. Describe major advantages and disadvantages of current tissue engineering methods.
3. General knowledge of tissue engineering products in market.

Course Learning Outcomes (CLO) (Required)

At the end of this course the student is knowledgeable in the following topics:

- Describe what is meant by the term of "tissue engineering" and explain the fundamentals
- Explain the critical factors for tissue formation and integration
- Describe different methods of tissue engineering and their principles
- Describe the current application of tissue engineering and oversee the future of tissue engineering field
- Read, understand and present papers and/or available tissue engineering products in market

Required Texts/Readings

Textbook

"Tissue Engineering" Senior Editor: Clemens Van Blitterswijk. Elsevier Inc., 1st edition, 2008.

Other Readings

"Principles of tissue Engineering" By: Robert Lanza, Robert Langer, 4th edition, 2013.

Other technology requirements / equipment / material

Laptop and/or tablet for online research during lecture is required.

Course Requirements and Assignments

This course requires basic knowledge in biology and biomedical engineering. Basic understanding on material and mechanical engineering is highly recommended.
Students must create a group with 2-3 other students and select a topic for final team presentation. The topic of presentation and the resources should be approved by the instructor. All members must be actively involved in the project.
This course has 3 total exams (2 mid-term and 1 final).

Final Examination or Evaluation

The final exam covers all the materials thought in this course.

Grading Information

Each exam will be curved to the highest possible score if the average is below 80%. There will be no make-up exams. If you miss an exam and have a valid, documented, university-approved excuse, that exam score will be replaced by the average of the other two exams.

3 exams (20% each mid-term and 25% final exam)
Team presentation 15%
Class quizzes and activities 15%
Hands-on project 5%

Extra credit will be given to those who actively participate in the class.

Determination of Grades

A+= 100-97%	**A= 96-93%**	**A-= 92-90%**
B+= 89-87%	**B= 86-83%**	**B-=82-80%**
C+= 79-77%	**C= 76-73%**	**C-= 72-70%**
D+= 69-67%	**D= 66-63%**	**D-= 62-60%**

University Policies

University-wide policy information relevant to all courses, such as academic integrity, accommodations, etc. will be available on Office of Graduate and Undergraduate Programs' Syllabus Information web page at http://www.sjsu.edu/gup/syllabusinfo/"

Course Number / Title, Semester, Course Schedule

Course Schedule (subject to change with advance notice)

Week	Date	Topics, Readings, Assignments, Deadlines
1	01/23/2020	Course Introduction/ Introduction to tissue engineering
2	01/30/2020	Stem Cells and Cell Signaling
3	02/06/2020	Polymeric Biomaterials
4	02/13/2020	Non-polymeric Biomaterials
5	02/20/2020	Cell Source + Exam 1
6	02/27/2020	Scaffold Design and Fabrication+ Library/literature search training (Room 213,
7	03/05/2020	Controlled Release for Tissue Engineering
8	03/12/2020	Bioreactors for Tissue Engineering
9	03/19/2020	Different Methods of Tissue Engineering
10	03/26/2020	Tissue Engineering for Cartilage + Exam 2
11	04/09/2020	Tissue Engineering for Bone
12	04/16/2020	Tissue Engineering for Organ Systems
13	04/23/2020	Team Based Presentation
14	04/30/2020	Team Based Presentation
15	05/07/2020	Team Based Presentation
16	05/14/2020	Final Exam