

Text Book: Tissue Engineering

Clemens Van Blitterswijk Academic Press 1st Edition 2009

Instructor: Daniel Hayes, E-mail: danielhayes@lsu.edu

Office Hours: TH 3:30-4:30 or by appointment

Teaching Assistant: None

Final Exam Date: TBD

Course Description:

This course is designed to familiarize current and future researchers with tissue engineering concepts and current practice. Topics covered include: analytical ex vivo systems, cell biology, cell

1. Understand the paradigms of tissue engineering and regenerative medicine.
2. Develop a more complete understanding of cell biology, development and tissue repair.
3. Improve knowledge of the mechanical and chemical properties of biomaterials.
4. Improve critical thinking and presentation skills.

- You will work on the **tissue engineering design projects** in groups. Each group will have the opportunity to present their work in front of the class and receive constructive feedback.
- **Examinations** missed due to an unexcused absence cannot be made up and a grade zero will be given for each one missed.
- Any student requiring **special arrangements** for taking exams, taking notes and other special arrangements please see or contact the instructor within the first two weeks of class.

Students are expected to comply with the Code of Student Conduct. For more information the Code of Student Conduct can be found at

Grading policy Grades will be determined based on the following breakdown:

(1) 15%.

LECTURE SCHEDULE

Date	Topic	Readings	
January	18	Introduction to the course	
	20	Science vs. Engineering	From Moodle
	22	Intro to Tissue Engineering	Introduction
	25	Intro to Stem Cells	Chapter 1
	27	<i>Literature Critique-Discussion</i>	From Moodle
	30	Tissue Dynamics	Chapter 2
February	1	Mid-term	Chapter 2
	3	<i>Literature Critique-Discussion</i>	From Moodle
	6	Cell Signaling	Chapter 4
	8	Tissue Organization	Chapter 7
	10	<i>Literature Critique-Discussion</i>	From Moodle
	13	Intro to Scaffolds and Materials	Chapter 5
	15	Natural Polymer Systems	Chapter 6
	17	<i>Literature Critique-Discussion</i>	From Moodle
March	24	Biocompatible Synthetics	Chapter 7
	27	Bioceramics	Chapter 8
	29	Biocompatibility	Chapter 9
March	3	<i>Literature Critique-Discussion</i>	From Moodle
	5	Cell Nutrition	Chapter 12
	7	Tissue Engineering Methods	Chapter 11
	9	<i>Literature Critique-Discussion</i>	From Moodle
	12	Cell Signaling	Chapter 10
	14	Design Project 1	Chapter 10
	16	<i>Mid-term Exam</i>	
	19	Cell Harvest	Chapter 11
	21	Scaffold Design	Chapter 14
	23	Design Project 2	Chapter 13
	26	Tailoring Biomaterials	Chapter 15
	28	Bioreactors Design	Chapter 16
	30	<i>Literature Critique-Discussion</i>	From Moodle
April	2	Tissue Engineering Bone	Chapter 17
	4	Tissue Engineering Skin	Chapter 19
	6	<i>Spring Break</i>	
	9	<i>Spring Break</i>	
	11	<i>Spring Break</i>	
	13	<i>Spring Break</i>	
	16	Host Integration and Cell Fate	Chapter 20
	19	Tissue Engineering Nervous System	Chapter 21
	21	Design Project 3	Chapter 21
	23	Design Project Presentations	
	25	Design Project Presentations	
	27	Design Project Presentations	
	30	Design Project Presentations	
May	2	Ethical Issues in Tissue Engineering	
	4	<i>Literature Critique-Discussion</i>	From Moodle

Exams: There are two exams, a midterm and a final each worth 30% of the total course grade. The exams will have both qualitative and quantitative portions testing theory and practical knowledge.

Design Project: This project will require students to propose a product, design the product, and assess the potential viability of the product in the current market. Considerations include demand, structure and market penetration. Students will work in groups of two. The project is worth 25% of the final grade.

Literature Critiques: Students will be required to prepare a literature critique on an article drawn from the relevant peer-reviewed journals. A one-page written critique will be included along with a fifteen-minute presentation (on Fridays) with class discussion. The critique is worth 15% of the final grade.