



Course Syllabus: Tissue Engineering & Regenerative Med. - B 318

Division	Biological and Environmental Sciences & Engineering Division
Course Number	B 318
Course Title	Tissue Engineering & Regenerative Med.
Academic Semester	Fall
Academic Year	2019/2020
Semester Start Date	08/25/2019
Semester End Date	12/10/2019
Class Schedule (Days & Time)	09:00 AM - 10:30 AM Mon Thu

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Charlotte Armgard Emmy Hauser	charlotte.hauser@kaust.edu.sa	+966128082524	4217, 2, Ibn Al-Haytham (bldg. 2)	By appointment

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	<p>The course covers major topics in tissue engineering and regenerative medicine. The fast moving fields of tissue engineering and regenerative medicine are considered to have transformative implications for future biomedical applications and the future health care. This course should give an overview on the current state in tissue engineering and regenerative medicine, for example stem cell bioengineering and cell therapy, at the level of basic principles and of specific applications, with additional focus on clinical trials.</p> <ul style="list-style-type: none"> - Tissue Engineering: Basics and Applications - Cell Reprogramming - Biomaterials for Regenerative Medicine - Regenerative Medicine: From Research to Clinical Practise - Overview of Enabling Technologies - Ethics and Patentability <p>Course Schedule: see Additional Information</p>
Course Description from Program Guide	<p>The course covers major topics in tissue engineering and regenerative medicine. The fast moving fields of tissue engineering and regenerative medicine are considered to have transformative implications for future biomedical applications and the future health care. This course gives an overview on the current state in tissue engineering and regenerative medicine, for example stem cell bioengineering and cell therapy, at the level of basic principles and of specific applications, with additional focus on clinical trials.</p>
Goals and Objectives	<p>This course aims that the students obtain deeper knowledge and understanding about the subject tissue engineering and tissue engineering. The objectives are given that students will learn about key technologies used in tissue engineering and regenerative medicine, will deal with the basic and clinical aspects of stem cell research, the conversion of stem cell types into a variety of suitable tissues and gain state-of-the-art knowledge on the potential of stem cells for the regeneration of a wide range of tissues and organs.</p>
Required Knowledge	Sufficient knowledge in Molecular Biology and Cell Biology

Reference Texts	<p>Books which can be found at the KAUST library:</p> <ul style="list-style-type: none"> -3D Bioprinting and Nanotechnology in Tissue Engineering and Regenerative Medicine by: Lijie Grace Zhang, John P Fisher and Kam Leong -Tissue Engineering by <i>Clemens Van Blitterswijk and Jan De Boer</i> -Principles of Tissue Engineering <i>Edited by: Robert Lanza, Robert Langer and Joseph P. Vacanti</i>
Method of evaluation	<p> 30.00% - Final exam 20.00% - Oral presentation 30.00% - Midterm exam 20.00% - Attendance and Participation </p>
Nature of the assignments	<ul style="list-style-type: none"> - Readings of given course material (e.g. text books and publications) - Oral presentations, at least 2 presentations, have to be prepared summarizing a specified paper (one 20 minutes presentation, one 10 minute presentation, including questioning/answers)
Course Policies	<p>Failure to fulfill the following requirements will result in failure of the course:</p> <ul style="list-style-type: none"> - Extension on assignments (presentation and group work) only allowed with valid reason and early notification - Punctual presence on Midterm/Final exam
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 08/26/2019 Thu 08/29/2019	Tissue Engineering: Introduction
2	Mon 09/02/2019 Thu 09/05/2019	The Basis of Growth and Differentiation
3	Mon 09/09/2019 Thu 09/12/2019	In Vitro Control of Tissue Development
4	Mon 09/16/2019 Thu 09/19/2019	In Vivo Synthesis of Tissues and Organs
5	Mon 09/23/2019 Thu 09/26/2019	Tutorial and Written exam
6	Mon 09/30/2019 Thu 10/03/2019	Biomaterials In Tissue Engineering
7	Mon 10/07/2019 Thu 10/10/2019	Transplantation of Engineered Cells and Tissues
8	Mon 10/14/2019 Thu 10/17/2019	Stem Cells
9	Mon 10/21/2019 Thu 10/24/2019	Gene Therapy
10	Mon 10/28/2019 Thu 10/31/2019	Regenerative Medicine Using Biomaterials
11	Mon 11/04/2019 Thu 11/07/2019	Regenerative Medicine Using Cells and Bioactive Factors
12	Mon 11/11/2019 Thu 11/14/2019	Clinical Experience
13	Mon 11/18/2019 Thu 11/21/2019	Tissue-Engineered Food, Regulation, Commercialization and Ethics
14	Mon 11/25/2019 Thu 11/28/2019	Experimental part
15	Mon 12/02/2019 Thu 12/05/2019	Submission of work project and oral exam on the project
16	Mon 12/09/2019	Summary and discussions on course

Note

The instructor reserves the right to make changes to this syllabus as necessary.