



## Course Syllabus: Contemporary Topics in Bioscience - B 394B

<b>Division</b>	Biological and Environmental Sciences & Engineering Division
<b>Course Number</b>	B 394B
<b>Course Title</b>	Contemporary Topics in Bioscience
<b>Academic Semester</b>	Fall
<b>Academic Year</b>	2019/2020
<b>Semester Start Date</b>	08/25/2019
<b>Semester End Date</b>	12/10/2019
<b>Class Schedule</b> (Days & Time)	05:30 PM - 07:00 PM   Sun Thu

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Nivine Mohammad Khachab	niveen.khashab@kaust.edu.sa	+966128082410	3277, 4, Al-Jazri (bldg. 4)	

Teaching Assistant(s)	
Name	Email

Course Information	
<b>Comprehensive Course Description</b>	
<b>Course Description from Program Guide</b>	
<b>Goals and Objectives</b>	
<b>Required Knowledge</b>	
<b>Reference Texts</b>	
<b>Method of evaluation</b>	
<b>Nature of the assignments</b>	
<b>Course Policies</b>	
<b>Additional Information</b>	

## Tentative Course Schedule

*(Time, topic/emphasis & resources)*

<b>Week</b>	<b>Lectures</b>	<b>Topic</b>
1	Sun 08/25/2019 Thu 08/29/2019	Semester starts
2	Sun 09/01/2019 Thu 09/05/2019	
3	Sun 09/08/2019 Thu 09/12/2019	
4	Sun 09/15/2019 Thu 09/19/2019	
5	Sun 09/22/2019 Thu 09/26/2019	University holiday
6	Sun 09/29/2019 Thu 10/03/2019	
7	Sun 10/06/2019 Thu 10/10/2019	
8	Sun 10/13/2019 Thu 10/17/2019	
9	Sun 10/20/2019 Thu 10/24/2019	
10	Sun 10/27/2019 Thu 10/31/2019	Mid-semester break
11	Sun 11/03/2019 Thu 11/07/2019	Mid-semester break
12	Sun 11/10/2019 Thu 11/14/2019	Mid-semester break
13	Sun 11/17/2019 Thu 11/21/2019	Mid-semester break
14	Sun 11/24/2019 Thu 11/28/2019	Mid-semester break
15	Sun 12/01/2019 Thu 12/05/2019	Mid-semester break
16	Sun 12/08/2019	Exams

### Note

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

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Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Stefan Theodor Arold	Stefan.Arold@KAUST.EDU.S A	+966128082557	4275, 2, Ibn Al-Haytham (bldg. 2)	upon request

Teaching Assistant(s)	
Name	Email

Course Information	
<b>Comprehensive Course Description</b>	one-on-one course on integrative structural biology
<b>Course Description from Program Guide</b>	
<b>Goals and Objectives</b>	special, tailored course. not openly accessible.
<b>Required Knowledge</b>	bioscience
<b>Reference Texts</b>	selected literature
<b>Method of evaluation</b>	100.00% - Homework /Assignments
<b>Nature of the assignments</b>	literature reading, report writing, two oral presentations
<b>Course Policies</b>	n.a.
<b>Additional Information</b>	This course is not open to other students.

## Tentative Course Schedule

*(Time, topic/emphasis & resources)*

<b>Week</b>	<b>Lectures</b>	<b>Topic</b>
1	Sun 08/25/2019 Thu 08/29/2019	Semester starts
2	Sun 09/01/2019 Thu 09/05/2019	literature reading, report writing
3	Sun 09/08/2019 Thu 09/12/2019	literature reading, report writing
4	Sun 09/15/2019 Thu 09/19/2019	literature reading, report writing
5	Sun 09/22/2019 Thu 09/26/2019	University holiday
6	Sun 09/29/2019 Thu 10/03/2019	literature reading, report writing
7	Sun 10/06/2019 Thu 10/10/2019	literature reading, report writing
8	Sun 10/13/2019 Thu 10/17/2019	presentation
9	Sun 10/20/2019 Thu 10/24/2019	literature reading, report writing
10	Sun 10/27/2019 Thu 10/31/2019	literature reading, report writing
11	Sun 11/03/2019 Thu 11/07/2019	literature reading, report writing
12	Sun 11/10/2019 Thu 11/14/2019	literature reading, report writing,
13	Sun 11/17/2019 Thu 11/21/2019	literature reading, report writing
14	Sun 11/24/2019 Thu 11/28/2019	literature reading, report writing
15	Sun 12/01/2019 Thu 12/05/2019	literature reading, report writing
16	Sun 12/08/2019	oral presentation

### **Note**

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# Course Syllabus: Contemporary Topics in Bioscience - B 394B

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

<b>Teaching Assistant(s)</b>	
<b>Name</b>	<b>Email</b>

<b>Course Information</b>	
<b>Comprehensive Course Description</b>	This course is designed to give the student a comprehensive hands on experience on the basic and advanced techniques in the field of tissue engineering and regenerative medicine. High weight of this course will be given to building various 3D culture systems using ultrashort self-assembling peptides as scaffolds. Subsequently, students will be required to characterize the newly developed 3D culture systems and to evaluate its suitability for tissue regeneration application by in vitro testing of cells viability and proliferation within the selected peptide scaffolds and comparing it to the commonly used monolayer culture systems.
<b>Course Description from Program Guide</b>	
<b>Goals and Objectives</b>	The main aim of this course is to help students understand fundamentals of tissue engineering and the advances of 3D culture and bioprinting technologies in the field. In this course students will be trained on advanced tissue engineering methods that involves the use of ultrashort peptide hydrogels as scaffolds. This will include performing several basic and advanced cellular techniques including monolayer and 3D cell culture, cytotoxicity, cells viability, immunofluorescent staining and imaging. This practical course will help students develop needed skills to work towards a well-defined research objective.
<b>Required Knowledge</b>	Knowledge in cell biology and in cell culturing are required. Knowledge in immunohistochemistry and PCR are also mandatory.
<b>Reference Texts</b>	1. Peptides and Proteins as Biomaterials for Tissue Regeneration and Repair, 1st edition, 2018, Elsevier, Edts: M. Barbosa and C. Martins 2. Tissue and Organ Regeneration in Adults by Ioannis Yannas, second edition, 2015, Springer
<b>Method of evaluation</b>	<b>20.00%</b> - Oral presentation <b>30.00%</b> - Written report <b>30.00%</b> - Research Project <b>20.00%</b> - Attendance and Participation
<b>Nature of the assignments</b>	The student will be requested to perform lab experiments and to write a well-structured lab report about them.
<b>Course Policies</b>	Not applicable

<b>Additional Information</b>	<p>Tissue engineering and regenerative medicine are interdisciplinary fields employing different techniques to develop in vitro human tissue diseased and healthy models and regenerate human cells, tissues and eventually organs. This course gives a comprehensive overview about advanced 3D bioprinting and 3D culture techniques and their implications in the tissue engineering.</p> <p>This course is only open for students with advanced background in tissue engineering</p>
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### Tentative Course Schedule

*(Time, topic/emphasis & resources)*

Week	Lectures	Topic
1	Sun 08/25/2019 Thu 08/29/2019	Basic cell culture techniques: Cell counting, seeding, subculturing and freezing (human dermal fibroblasts, HDFn)
2	Sun 09/01/2019 Thu 09/05/2019	Ultrashort-self assembling peptide hydrogels: Determination of minimum gelation time and concentration
3	Sun 09/08/2019 Thu 09/12/2019	3D cell cultures of HDFn cells on selected peptide hydrogels and cell viability assays at different time point
4	Sun 09/15/2019 Thu 09/19/2019	Tutorial and paper presentation
5	Sun 09/22/2019 Thu 09/26/2019	Cell proliferation assays at different time points
6	Sun 09/29/2019 Thu 10/03/2019	Lab report submission and discussion
7	Sun 10/06/2019 Thu 10/10/2019	Immunostaining techniques for HDFn cell specific markers
8	Sun 10/13/2019 Thu 10/17/2019	Imaging using fluorescence microscopy
9	Sun 10/20/2019 Thu 10/24/2019	Z-scans for 3D fluorescence microscopy
10	Sun 10/27/2019 Thu 10/31/2019	2D co-cultures of human dermal fibroblasts and dermal keratinocytes
11	Sun 11/03/2019 Thu 11/07/2019	3D co-cultures of human dermal fibroblasts and dermal keratinocytes
12	Sun 11/10/2019 Thu 11/14/2019	Cell viability assays and immunostaining techniques for co-cultured systems in 3D
13	Sun 11/17/2019 Thu 11/21/2019	Cell proliferation assays in 3D
14	Sun 11/24/2019 Thu 11/28/2019	Cell imaging in 3D using confocal microscopy
15	Sun 12/01/2019 Thu 12/05/2019	Live imaging using confocal microscopy
16	Sun 12/08/2019	Final lab report

**Note**

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# Course Syllabus: Contemporary Topics in Bioscience - B 394B

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<b>Instructor(s)</b>				
<b>Name</b>	<b>Email</b>	<b>Phone</b>	<b>Office Location</b>	<b>Office Hours</b>
Arnab Pain	Arnab.Pain@Kaust.edu.sa	+966128082561	4236, 2, Ibn Al-Haytham (bldg. 2)	Room 4236, Building 2, Level 4 (Sunday - Thursday) - 9 am - 6 pm. Prior appointments may be necessary.

<b>Teaching Assistant(s)</b>	
<b>Name</b>	<b>Email</b>

<b>Course Information</b>	
<b>Comprehensive Course Description</b>	The course will involve a comprehensive understanding of the role of microorganisms in cancer biology. The course will involve regular 1:1 discussion sessions on published work on microbial-induced cancers and will require writing up a comprehensive review in the format of a review article in <i>Nature Reviews Microbiology</i> . A 45-minute presentation on the reviewed topic will also be required as part of the curriculum.
<b>Course Description from Program Guide</b>	
<b>Goals and Objectives</b>	To provide a comprehensive understanding of the topic of interest - the role of microorganisms in cancers.
<b>Required Knowledge</b>	An MS level understanding of basic Cell Biology and Microbiology is essential.
<b>Reference Texts</b>	Several scientific papers will need to be consulted - there are no set pieces of reference materials for this course.
<b>Method of evaluation</b>	<b>10.00%</b> - Active participation <b>50.00%</b> - Written report <b>40.00%</b> - Oral presentation
<b>Nature of the assignments</b>	1. A review article in <i>Nature Reviews Microbiology</i> format. 2. Scientific presentation on the topic - final.
<b>Course Policies</b>	Regular interactions and exchange of ideas are essential.
<b>Additional Information</b>	

## Tentative Course Schedule

*(Time, topic/emphasis & resources)*

<b>Week</b>	<b>Lectures</b>	<b>Topic</b>
1	Sun 08/25/2019 Thu 08/29/2019	Semester starts
2	Sun 09/01/2019 Thu 09/05/2019	Review of literature & 1:1 interaction with the course instructor
3	Sun 09/08/2019 Thu 09/12/2019	Review of literature & 1:1 interaction with the course instructor
4	Sun 09/15/2019 Thu 09/19/2019	Review of literature
5	Sun 09/22/2019 Thu 09/26/2019	University holiday
6	Sun 09/29/2019 Thu 10/03/2019	Review of literature
7	Sun 10/06/2019 Thu 10/10/2019	Review of literature
8	Sun 10/13/2019 Thu 10/17/2019	Review of literature & 1:1 interaction with the course instructor
9	Sun 10/20/2019 Thu 10/24/2019	Review of literature
10	Sun 10/27/2019 Thu 10/31/2019	Review of literature
11	Sun 11/03/2019 Thu 11/07/2019	Review of literature & 1:1 interaction with the course instructor
12	Sun 11/10/2019 Thu 11/14/2019	Review of literature
13	Sun 11/17/2019 Thu 11/21/2019	Review of literature & 1:1 interaction with the course instructor
14	Sun 11/24/2019 Thu 11/28/2019	Written review submission
15	Sun 12/01/2019 Thu 12/05/2019	Presentation
16	Sun 12/08/2019	Feedback and review of the course

### Note

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