



Course Syllabus: Cell Structure, Development & Physiol. I - B 224

Division	Biological and Environmental Sciences & Engineering Division
Course Number	B 224
Course Title	Cell Structure, Development & Physiol. I
Academic Semester	Fall
Academic Year	2018/2019
Semester Start Date	08/26/2018
Semester End Date	12/11/2018
Class Schedule (Days & Time)	01:00 PM - 02:30 PM Mon Thu

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Mark Alfred Tester	Mark.Tester@KAUST.EDU.S A	+966128025258	3233, 2, Ibn Al-Haytham (bldg. 2)	<i>available by email; personal meetings upon request</i>
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Teaching Assistant(s)	
Name	Email
The course is taught by Prof. Wolfgang Fischle, Prof. Stefan Arold and Prof. Mark Tester	stefan.arold@kaust.edu.sa; mark.tester@kaust.edu.sa

Course Information	
Comprehensive Course Description	This course covers distinct aspects of modern Cell Biology: cellular regulatory systems and networks, subcellular structures, organization principles of cells, signaling transduction pathways, information flow to, out of and within cells, the basic biomolecules of life and the processes and reactions fundamental to life. Three Professors with different scientific background will cover distinct areas of Cell Biology on the example of breakthrough experiments and discoveries in the field. A main aspect of the class is to build the foundation for students to synergize different themes and concepts of Cell Biology into a "bigger picture".
Course Description from Program Guide	The scope of this course is to provide a comprehensive overview of eukaryotic cell structure and the fundamental functional aspects of membranes, organelles, nuclear architecture, genome and epigenome in the context of development, specialization, and integration with the environment.
Goals and Objectives	The class aims at providing participants with elemental, theoretical understanding of basic phenomena in Cell Biology and the molecular principles of cell regulation. The course builds the foundation for Cell Structure, Development & Physiology II, which runs in spring. The far reaching objective of both classes together is to teach students the fundamental scientific principles of life on the level of cells and to provide them with the essential knowledge in Cell Biology that is required for executing directed research and M.Sc. study projects within the laboratories of the BESE division.

Required Knowledge	<ul style="list-style-type: none"> - comprehension of basic concepts in cell biology - basic knowledge in chemistry, biochemistry, molecular biology - the course extends various 100 level classes - reference knowledge level: Alberts et al., Essential Cell Biology, 4th edition
Reference Texts	<ul style="list-style-type: none"> - Alberts et al., Molecular Biology of the Cell, 6th edition - detailed handouts and studying recommendations provided by the Professors teaching the different classes
Method of evaluation	<p>50.00% - Exam 2 50.00% - Exam 1</p>
Nature of the assignments	<p>1) On the basis of the lectures, students need to deepen their understanding of different topics of Cell Biology by independent study using textbooks and other sources. The lectures will only cover specific aspects of Cell Biology but these are not comprehensive on the subject. It is essential that students use the lectures as foundation for further self-directed learning.</p> <p>2) Professors might assign homework of analyzing and answering specific questions in written form or for presentation in front of the class.</p>
Course Policies	<p>Attendance of classes is mandatory. Planned absence(s) needs to be discussed with the course instructors. A max. of 2 classes can be missed unexcused.</p>
Additional Information	<p>Students will need to pass two separate written exams at midterm and at the end of the course. The threshold level for passing each exam is 60%. The first exam covers the topics of the first half of the course, the second exam covers the topics of the second half of the course. The exam questions will address the level at which students have comprehended the essential concepts of Cell Biology, probe their ability to synergize different themes and concepts as well as test their analytical skills. The difficulty level of the exam questions is similar to the test questions discussed in - Alberts et al., Molecular Biology of the Cell, 6th edition at the end of the individual chapters. Students should actively work with the questions in the text book to control their learning progress and in preparation for the exams.</p>

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 08/27/2018 Thu 08/30/2018	Course Presentation/Expectations Discussion of Entry Exam
2	Mon 09/03/2018 Thu 09/06/2018	The Cell as Organisational Principle Proteins – Structure and Function
3	Mon 09/10/2018 Thu 09/13/2018	Cytoskeleton Cell Adhesion
4	Mon 09/17/2018 Thu 09/20/2018	Cell Signaling I Cell Signaling II
5	Mon 09/24/2018 Thu 09/27/2018	Cell Signaling III Cellular Membranes
6	Mon 10/01/2018 Thu 10/04/2018	Membrane Transport and Electrical Properties of Membranes I Membrane Transport and Electrical Properties of Membranes II
7	Mon 10/08/2018 Thu 10/11/2018	Mitochondria and Chloroplasts I Mitochondria and Chloroplasts II
8	Mon 10/15/2018 Thu 10/18/2018	Intracellular Compartments and Protein Sorting Intracellular Vesicular Traffic
9	Mon 10/22/2018 Thu 10/25/2018	First Exam Discussion of Exam
10	Mon 10/29/2018 Thu 11/01/2018	Nucleic Acids- Structure and Function Chromatin
11	Mon 11/05/2018 Thu 11/08/2018	Genome Organization and Nuclear Architecture Replication, Recombination, Repair I
12	Mon 11/12/2018 Thu 11/15/2018	Replication, Recombination, Repair II Transcription, Translation I
13	Mon 11/19/2018 Thu 11/22/2018	Transcription, Translation II Regulation of Genome Readout I
14	Mon 11/26/2018 Thu 11/29/2018	Regulation of Genome Readout II Regulatory RNAs
15	Mon 12/03/2018 Thu 12/06/2018	Cellular Networks, Systems Biology Nuclear Homeostasis
16	Mon 12/10/2018	Second Exam
17		
18		

Note

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