



Course Syllabus: Introductory Molecular Biology - B 104

Division	Biological and Environmental Sciences & Engineering Division
Course Number	B 104
Course Title	Introductory Molecular Biology
Academic Semester	Spring
Academic Year	2018/2019
Semester Start Date	01/27/2019
Semester End Date	05/23/2019
Class Schedule (Days & Time)	11:30 AM - 01:00 PM Mon Thu

Instructor(s)				
Name	Email	Phone	Office Location	Office Hours
Michael Florian Mette	florian.mette@kaust.edu.sa	+966128082625		Bldg. 2, Level 4, Room 4327; anytime during working hours, please fix an appointment by email;

Teaching Assistant(s)	
Name	Email

Course Information	
Comprehensive Course Description	<p>This course aims at an audience with basic competences in molecular biology and genetics. It will serve as a reminder as well as extension course for those intending to major in all disciplines in biology. The class starts with an overview over the features of DNA as the carrier of genetic information in cells and the mechanisms by which it is maintained over cell generations. Further, it addresses the fundamental mechanisms by which the information encoded in DNA is transcribed into RNA and then translated into proteins as functional units. Basic concepts of eukaryote genetics such as chromosome function will be covered, as well as aspects of bacterial genetics relevant for experimental molecular biology.</p> <p>Upfront teaching in lectures will be combined with problem-based interactive approaches. Exemplary problems will be studied to further familiarize students with the essential concepts that will be built on in the advanced courses Cell Biology I B 224 and Cell Biology II B 213, Molecular and Cell Biology Lab B 241, as well as Genomics B 204. A central goal of the course is to make students aware of how deductive processes are applied in biological research for the advancement to new insight.</p>
Course Description from Program Guide	<p>This course aims at an audience with basic competences in molecular biology and genetics. It will serve as a reminder as well as extension course for those intending to major in all disciplines in biology. The class starts with an overview over the features of DNA as the carrier of genetic information in cells and the mechanisms by which it is maintained over cell generations. Further, it addresses the fundamental mechanisms by which the information encoded in DNA is transcribed into RNA and then translated into proteins as functional units. Basic concepts of eukaryote genetics such as chromosome function and Mendelian heredity will be covered, as well as aspects of bacterial genetics relevant for experimental molecular biology.</p>
Goals and Objectives	<p>This course aims to provide students with a solid theoretical foundation in basic molecular biology and genetics in order to prepare them for more advanced classes. It is in particular designed as a follow-up of B 102 Introductory Cell Biology course and well complements course B 101 Introductory Biochemistry held in parallel.</p>
Required Knowledge	<p>Basic understanding of general science, topics covered in courses B 102 Introductory Cell Biology and B 100 Basic Chemistry for Life Sciences;</p>

Reference Texts	Lewin's Genes XII 12th revised edition (2017) Jocelyn E. Krebs, Elliott S. Goldstein, Stephen T. Kilpatrick Language: English ISBN: 9781284104493
Method of evaluation	25.00% - Homework /Assignments 75.00% - Tests
Nature of the assignments	Students will be required to perform solving of short text and calculation problems in home assignments. Submission of all assignments in acceptable form in writing is a requirement for passing the course. Solutions of problems will then be discussed in tutorial classes.
Course Policies	Attendance of and active participation in classes is mandatory. All assignments need to be delivered in due time. Any planned absence needs to be discussed with the course instructor and program chair.
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 01/28/2019 Thu 01/31/2019	Lecture - Genes are DNA (Chap. 1) Lecture - Genes encode RNAs and Proteins (Chap. 1 and 3)
2	Mon 02/04/2019 Thu 02/07/2019	Tutorial – Chap. 1 and 3 Lecture - DNA Replication and Cell Cycle (Chap. 9 and 10)
3	Mon 02/11/2019 Thu 02/14/2019	Lecture - DNA Replication Mechanisms (Chap. 11) Tutorial – Chap. 9, 10, and 11
4	Mon 02/18/2019 Thu 02/21/2019	Lecture - DNA Repair Systems (Chap. 14) Lecture – Homologous and Site-Specific Recombination (Chap. 13)
5	Mon 02/25/2019 Thu 02/28/2019	Tutorial – Chap. 13 and 14 Exam Part A - DNA, the Carrier of Genetic Information
6	Mon 03/04/2019 Thu 03/07/2019	Lecture - Prokaryotic Transcription (Chap. 17) Lecture - Eukaryotic Transcription and RNA Processing (Chap. 18 and 19)
7	Mon 03/11/2019 Thu 03/14/2019	Tutorial – Chap. 17, 18, and 19 Lecture – mRNA Stability and Localization (Chap. 20)
8	Mon 03/18/2019 Thu 03/21/2019	Lecture - The Genetic Code (Chap. 23) Tutorial – Chap. 20 and 23
9	Mon 03/25/2019 Thu 03/28/2019	Spring Break
10	Mon 04/01/2019 Thu 04/04/2019	Lecture - Translation Part I (Chap. 22) Lecture - Translation Part II (Chap. 22)
11	Mon 04/08/2019 Thu 04/11/2019	Tutorial – Chap. 22 Exam Part B - From DNA to Proteins
12	Mon 04/15/2019 Thu 04/18/2019	Lecture – The Operon (Chap. 24) Lecture – Chromatin and Chromosomes (Chap. 7 and 8)
13	Mon 04/22/2019 Thu 04/25/2019	Tutorial – Chap. 7, 8, and 24 Lecture – Eukaryotic Transcription Regulation (Chap. 26)
14	Mon 04/29/2019 Thu 05/02/2019	Lecture – Basics of Epigenetics (Chap. 27 and 28) Tutorial – Chap. 26, 27, and 28
15	Mon 05/06/2019 Thu 05/09/2019	Lecture - Plasmids, Conjugation, and Transformation (Chap. 12) Lecture – Methods in Molecular Biology (Chap. 2)
16	Mon 05/13/2019 Thu 05/16/2019	Tutorial – Chap. 2 and 12 Exam Part C - Gene Regulation
17	Mon 05/20/2019 Thu 05/23/2019	Final Exam Week

Note

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