جامعة الملك عبدالله
للعلوم والتقنية
King Abdullah University of
Science and Technology

Course Syllabus: Molecular & Cellular Biology - B 241

Division	Biological and Environmental Sciences & Engineering Division
Course Number	B 241
Course Title	Molecular & Cellular Biology
Academic Semester	Spring
Academic Year	2018/2019
Semester Start Date	01/27/2019
Semester End Date	05/23/2019
Class Schedule (Days & Time)	01:00 PM - 02:30 PM | Sun Wed

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Samir Hamdan	samir.hamdan@kaust.edu.sa	+966128082384		Tuesday: 10:00-11:00 am Building 2 Room 4221
Samah Zeinab Gadhoum	Samah.Gadhoum@kaust.edu.sa	+966128082930		

Teaching Assistant(s)

Name	Email
Dr. Samah Zeineb Gadhoum; Building 9, third floor and room 3354	samah.gadhoum@kaust.edu.sa

Course Information

Comprehensive Course Description	The course provides first hands-on experience in a molecular and cellular biology laboratory setting, exposing the students to a number of techniques that are commonly used in biochemistry, molecular and cellular biology research laboratories. These include enzyme kinetics, spectrophotometry, plasmid transformation, plasmid isolation, plasmid restriction digestion, protein expression and purification, small-interfering RNAs (siRNA) and gene expression, isolation of RNA, analysis of gene expression by polymerase chain reaction (PCR) and RT-qPCR, immunofluorescence and confocal microscopy. The course itself consists of several parts. The lectures, held prior to the beginning of a new experiment, serve to provide students with background on the experiment and/or techniques to be used, and may also explore alternative techniques. The students will then get to put into practice what they have learned from the lecture and reading the laboratory manual, as well as additional materials, if necessary. Finally, the laboratory report on each experiment allows the assessment of what the students have done, and also help train the students in proper experimental recording methods. All of these components will help the students to develop as a scientist.
Course Description from Program Guide	This course covers principles and practices of basic molecular and cellular biology techniques; Introduction to skills in a Molecular and Cellular Biology lab; Plasmids; transformation, isolation and restriction digestion; protein production, purification and functional assay; Small-interfering RNAs (siRNA) and gene expression; Isolation of RNA and Analysis of gene expression by Ploymerase Chain Reacation (PCR) and RT-qPCR; Immunofluorescence; following cellular movement of a shuttling RNA-binding protein before and after stress.
Goals and Objectives	The course aim to provide first hands-on experience in a molecular and cellular biology laboratory setting, exposing the students to a number of techniques that are commonly used in biochemistry, molecular and cellular biology research laboratories. This will give MS students basic skills to start their research directed study courses, enternships and thesis work.
Required Knowledge	The students are expected to have basic foundation in biochemisrty, molecular biology and cell biology.

Reference Texts	Laboratory Manual for Methods in Molecular and Cellular Biology
Method of evaluation	**15.00**% - Active participation **85.00**% - Homework /Assignments
Nature of the assignments	The assignments will consist of lab written reports, lab oral presentation reports, experimental flow sheets, short essay and lab quizzes
Course Policies	Attendance of and active participitation in lectures and lab is mandatory. Any planned absence needs to be discussed with the course instructor.
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Sun 01/27/2019 Wed 01/30/2019	Introduction to Molecular and Cellular Biology Experiments
2	Sun 02/03/2019 Wed 02/06/2019	Enzyme Kinetics/Spectrophotometry
3	Sun 02/10/2019 Wed 02/13/2019	Plasmids: Transformation, Isolation and Restriction Digestion
4	Sun 02/17/2019 Wed 02/20/2019	Lab work
5	Sun 02/24/2019 Wed 02/27/2019	Protein Purification and Translation
6	Sun 03/03/2019 Wed 03/06/2019	Lab work
7	Sun 03/10/2019 Wed 03/13/2019	Small-interfering RNAs (siRNA) and gene expression
8	Sun 03/17/2019 Wed 03/20/2019	Lab work
9	Sun 03/24/2019 Wed 03/27/2019	No class (spring break)
10	Sun 03/31/2019 Wed 04/03/2019	Isolation of RNA and Analysis of gene expression by Polymerase Chain Reaction (PCR) and RT-qPCR
11	Sun 04/07/2019 Wed 04/10/2019	Lab work
12	Sun 04/14/2019 Wed 04/17/2019	Evaluation
13	Sun 04/21/2019 Wed 04/24/2019	Immunofluorescence: following the cellular movement of a shuttling RNA-binding protein before and after stress
14	Sun 04/28/2019 Wed 05/01/2019	Evaluation
15	Sun 05/05/2019 Wed 05/08/2019	Tutorial and discussion
16	Sun 05/12/2019 Wed 05/15/2019	
17	Sun 05/19/2019 Wed 05/22/2019	Final Exam

Note

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

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1	Mon 01/28/2019 Thu 01/31/2019	Introduction to Molecular and Cellular Biology Experiments
2	Mon 02/04/2019 Thu 02/07/2019	Enzyme Kinetics/Spectrophotometry
3	Mon 02/11/2019 Thu 02/14/2019	Report writing Plasmids: Transformation, Isolation and Restriction Digestion
4	Mon 02/18/2019 Thu 02/21/2019	Plasmids: Transformation, Isolation and Restriction Digestion Report writing
5	Mon 02/25/2019 Thu 02/28/2019	Protein Purification and Translation
6	Mon 03/04/2019 Thu 03/07/2019	Protein Purification and Translation Evaluation
7	Mon 03/11/2019 Thu 03/14/2019	Evaluation Small-interfering RNAs (siRNA) and gene expression
8	Mon 03/18/2019 Thu 03/21/2019	Small-interfering RNAs (siRNA) and gene expression Evaluation
9	Mon 03/25/2019 Thu 03/28/2019	No classes (Spring break)
10	Mon 04/01/2019 Thu 04/04/2019	Evaluation Isolation of RNA and Analysis of gene expression by Polymerase Chain Reaction (PCR) and RT-qPCR
11	Mon 04/08/2019 Thu 04/11/2019	Isolation of RNA and Analysis of gene expression by Polymerase Chain Reaction (PCR) and RT-qPCR
12	Mon 04/15/2019 Thu 04/18/2019	Evaluation
13	Mon 04/22/2019 Thu 04/25/2019	Immunofluorescence: following the cellular movement of a shuttling RNA-binding protein before and after stress
14	Mon 04/29/2019 Thu 05/02/2019	Evaluation Evaluation
15	Mon 05/06/2019 Thu 05/09/2019	Tutorials and Discussions
16	Mon 05/13/2019 Thu 05/16/2019	
17	Mon 05/20/2019 Thu 05/23/2019	Final Exam Week

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