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	Fall
Academic Year	2019/2020
Semester Start Date	08/25/2019
Semester End Date	12/10/2019
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	**85.00**% - Homework /Assignments **15.00**% - Active participation
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 08/25/2019 Wed 08/28/2019	08/25/2019 Introduction to Molecular and Cellular Biology Experiments 08/28/2019 Enzyme Kinetics/Spectroscopy
2	Sun 09/01/2019 Wed 09/04/2019	Lab work
3	Sun 09/08/2019 Wed 09/11/2019	Lab work
4	Sun 09/15/2019 Wed 09/18/2019	09/15/2019 Plasmids: Transformation, Isolation and Restriction Digestion 09/18/2019 Lab work
5	Sun 09/22/2019 Wed 09/25/2019	09/22/2019 University holiday 09/25/2019 Lab work
6	Sun 09/29/2019 Wed 10/02/2019	09/29/2019 Protein Purification and Translation 10/02/2019 Lab work
7	Sun 10/06/2019 Wed 10/09/2019	Lab work
8	Sun 10/13/2019 Wed 10/16/2019	10/13/2019 Lab work 10/16/2019 Small-interfering RNAs (siRNA) and gene expression
9	Sun 10/20/2019 Wed 10/23/2019	Lab work
10	Sun 10/27/2019 Wed 10/30/2019	10/27/2019 Mid-semester break 10/30/2019 Lab work
11	Sun 11/03/2019 Wed 11/06/2019	11/03/2019 Isolation of RNA and Analysis of Gene Expression by Polymerase Chain Reaction (PCR) and RT-qPCR 11/06/2019 Lab work
12	Sun 11/10/2019 Wed 11/13/2019	Lab work
13	Sun 11/17/2019 Wed 11/20/2019	Lab work
14	Sun 11/24/2019 Wed 11/27/2019	11/24/2019 Isolation of RNA and Analysis of Gene Expression by Polymerase Chain Reaction (PCR) and RT-qPCR 11/27/2019 Lab work
15	Sun 12/01/2019 Wed 12/04/2019	Strudent evaluation
16	Sun 12/08/2019	Student evaluation

Note

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

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	Fall
Academic Year	2019/2020
Semester Start Date	08/25/2019
Semester End Date	12/10/2019
Class Schedule (Days & Time)	02:30 PM - 06:00 PM | Mon Thu

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	Mon 08/26/2019 Thu 08/29/2019	Introduction to Molecular and Cellular Biology Experiments Group 1: Aug 26 Group 2: Aug 27 08/29/2019 Student evaluation
2	Mon 09/02/2019 Thu 09/05/2019	Enzyme Kinetics/Spectrophotometry Group 1: Sept 5 and 9 Group 2: Sept 3 and 4
3	Mon 09/09/2019 Thu 09/12/2019	Enzyme Kinetics/Spectrophotometry Group 1: Sept 5 and 9 Group 2: Sept 3 and 4 09/12/2019 Student evaluation
4	Mon 09/16/2019 Thu 09/19/2019	Plasmids: Transformation, Isolation and Restriction Digestion Group 1: Sept 16, 19 Group 2: Sept 17, 18
5	Mon 09/23/2019 Thu 09/26/2019	09/23/2019 University holiday 09/26/2019 Student evaluation
6	Mon 09/30/2019 Thu 10/03/2019	Protein Purification and Translation Group 1: Sept 30, Oct 3, 7 Group 2: Oct 1, 2 and 8
7	Mon 10/07/2019 Thu 10/10/2019	Protein Purification and Translation Group 1: Sept 30, Oct 3, 7 Group 2: Oct 1, 2 and 8 10/10/2019 Student evaluation
8	Mon 10/14/2019 Thu 10/17/2019	10/14/2019 Student evaluation Small-interfering RNAs (siRNA) and Gene expression Group 1: Oct 17, 21 Group 2: Oct 22, 23
9	Mon 10/21/2019 Thu 10/24/2019	Small-interfering RNAs (siRNA) and Gene expression Group 1: Oct 17, 21 Group 2: Oct 22, 23 10/24/2019 Student evaluation
10	Mon 10/28/2019 Thu 10/31/2019	10/28/2019 Mid-semester break 10/31/2019 Student evaluation
11	Mon 11/04/2019 Thu 11/07/2019	Isolation of RNA and Analysis of Gene Expression by Polymerase Chain Reaction (PCR) and RT-qPCR Group 1: Nov 4, 7 and 11 Group 2: Nov 5, 6 and 12
12	Mon 11/11/2019 Thu 11/14/2019	Isolation of RNA and Analysis of Gene Expression by Polymerase Chain Reaction (PCR) and RT-qPCR Group 1: Nov 4, 7 and 11 Group 2: Nov 5, 6 and 12 11/14/2019 Student evaluation
13	Mon 11/18/2019 Thu 11/21/2019	Student evaluation

14	Mon 11/25/2019 Thu 11/28/2019	Immunofluorescence: Following the Cellular Movement of a Shuttling RNA-Binding Protein Before and After Stress Group 1: Nov 25 and 28 Group 2: Nov 26 and 27
15	Mon 12/02/2019 Thu 12/05/2019	Student evaluation
16	Mon 12/09/2019	Student evaluation

Note

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