



Course Syllabus: Synthetic Biology and Biotechnology - B 206

Division	Biological and Environmental Sciences & Engineering Division
Course Number	B 206
Course Title	Synthetic Biology and Biotechnology
Academic Semester	Fall
Academic Year	2018/2019
Semester Start Date	08/26/2018
Semester End Date	12/11/2018
Class Schedule (Days & Time)	10:30 AM - 12:00 PM Mon Thu

Instructor(s)

Name	Email	Phone	Office Location	Office Hours
Charlotte Armgard Emmy Hauser	charlotte.hauser@kaust.edu.sa	+966128082524	4217, 2, Ibn Al-Haytham (bldg. 2)	By appointment

Teaching Assistant(s)

Name	Email
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Course Information

Comprehensive Course Description	The course covers major topics in Biotechnology at the level of fundamental principle and of specific applications <ul style="list-style-type: none"> - Biotechnology: Scope and applications in medicine, agriculture, marine biology and industry - Synthetic Biology: Principles and applications - Overview of enabling technologies - Ethics and Patentability
Course Description from Program Guide	Principles and applications of biotechnology; introduction to key enabling technologies; genetic circuits in natural systems; engineering principles in biology; BioBricks and standardization of biological components; numerical methods for systems analysis and design; fabrication of genetic systems in theory and practice; transformation and characterization; examples of engineered systems.
Goals and Objectives	This course aims that the students obtain knowledge and understanding about the subject biotechnology and synthetic biotechnology. The objectives are given that students will learn about key technologies, such as recombinant DNA technologies, genome engineering, genomics and proteomics and how these technologies are used for specific applications. Additionally, emphasis is on entrepreneurial aspects using biotechnology and/or synthetic biology.
Required Knowledge	Sufficient knowledge in Molecular Biology

Reference Texts	Books which can be found at the KAUST library: -Synthetic Biology: Tools and Applications Edited by: Huimin Zhao http://www.sciencedirect.com/science/book/9780123944306 -Bioengineering: A Conceptual Approach by Mirjana Pavlovic http://0-link.springer.com.library.kaust.edu.sa/book/10.1007/978-3-319-10798-1
Method of evaluation	30.00% - Final exam 20.00% - Oral presentation 30.00% - Midterm exam 20.00% - Attendance and Participation
Nature of the assignments	- Readings of given course material (e.g. text books and publications) - The group project is a collectively prepared scientific manuscript on a given subject - An oral presentation has to be prepared summarizing a specified paper (8 minute presentation followed by 2 minutes of questioning/answers)
Course Policies	Failure to fulfill the following requirements will result in failure of the course: - Extension on assignments (presentation and group work) only allowed with valid reason and early notification - Punctual presence on Midterm/Final exam
Additional Information	

Tentative Course Schedule

(Time, topic/emphasis & resources)

Week	Lectures	Topic
1	Mon 08/27/2018 Thu 08/30/2018	Introduction to Biotechnology and Synthetic Biology (Hauser)
2	Mon 09/03/2018 Thu 09/06/2018	Recombinant DNA technology (Hauser)
3	Mon 09/10/2018 Thu 09/13/2018	Genome Engineering Technologies (Mahfouz)
4	Mon 09/17/2018 Thu 09/20/2018	Genome engineering and synthetic biology applications (Mahfouz)
5	Mon 09/24/2018 Thu 09/27/2018	Genomics and Synthetic Biology (Mahfouz)
6	Mon 10/01/2018 Thu 10/04/2018	Tutorial and examination (Hauser & Mahfouz)
7	Mon 10/08/2018 Thu 10/11/2018	Protein design/expression in prokaryotic and eukaryotic cells (Vaccine therapeutics) (Hauser)
8	Mon 10/15/2018 Thu 10/18/2018	Animal biotechnology (Hauser)
9	Mon 10/22/2018 Thu 10/25/2018	Medical biotechnology and gene therapy (Hauser)
10	Mon 10/29/2018 Thu 11/01/2018	Plant biotechnology (Mahfouz)
11	Mon 11/05/2018 Thu 11/08/2018	Plant synthetic biology (Mahfouz)
12	Mon 11/12/2018 Thu 11/15/2018	Microbial biotechnology (Mahfouz)
13	Mon 11/19/2018 Thu 11/22/2018	Ethics, patentability, entrepreneurship, and industrial enterprises (Hauser)
14	Mon 11/26/2018 Thu 11/29/2018	Tutorial and examination (Hauser & Mahfouz)
15	Mon 12/03/2018 Thu 12/06/2018	Course Project
16	Mon 12/10/2018	Course Project

Note

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