

Subject (English)	Chemical and Biomolecular Engineering II		Semester	Spring	Day/Slot	Wed. / 3 <sup>rd</sup> 13:00-14:30
科目名 (日本語)	化学・バイオ工学Ⅱ					
Course Code	TB37031	Course Numbering	TCH-BIO305		Period	Apr. 10 – Jul. 17, 2019
Instructor (Post)	Hitoshi Shiku, <i>et al.</i> (Prof.)				Campus	Aobayama
					Building	<a href="#">Department of Applied Chemistry, Chemical Engineering and Biomolecular Engineering</a>
Faculty	Department of Applied Chemistry, Chemical Engineering and Biomolecular Engineering		Credits	2	Class Room	Room "Kasho 1"
Class subject		-				
Object and summary of class						
Biomolecular engineering refers to any technological applications of chemical and biological systems, such as biomolecules and environmental materials to make or modify products or green processes for specific purposes. This class focuses on biomaterials, biomedical engineering, membrane transport, metabolic engineering, environmentally benign materials and reactions, biomass conversion, green process and life cycle assessment. Students will learn some basic aspects of engineering for biotechnology, biological and environmental materials.						
Keywords		-				
Goal of study						
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Contents and progress schedule of class						
No	Date	Topics				
1	4/10	1. Biomaterials and cell Culture (Prof. Hitoshi SHIKU)		1-1. Cell culture and embryology		
2	4/17			1-2. Tissue engineering and biomaterials		
3	4/24	2. Principles of Biological membrane transport (Prof. Nobuyuki UOZUMI)		2-1. Structure and function of ion transport system		
4	5/8			2-2. Cellular response to abiotic and biotic stress		
5	5/15	3. Plant specialized metabolites (Assoc. Prof. Seiji TAKAHASHI)		3-1. Basic sciences and histories of use		
6	5/22			3-2. Metabolic engineering for production of valuable Metabolites		
7	5/29	4. Development of environmentally benign materials (Assoc. Prof. Naoya MOROHASHI)		4-1. Host–guest chemistry and separation materials using host molecules		
8	6/5			4-2. Separation materials using host molecules		
9	6/12	5. Reaction process engineering for sustainable technology (Assoc. Prof. Atsushi TAKAHASHI)		5-1. Catalytic process for biomass conversion into chemicals		
10	6/19			5-2. Process engineering in hydrogen carrier system		
11	6/26	6. Chemical Systems Engineering (Assoc. Prof. Yasuhiro FUKUSHIMA)		6-1. Basics in evaluating sustainability aspects of process technologies		
12	7/3			6-2. A case study on integrated biological, agricultural and chemical process systems design		
13	7/10	7. Biomass refinery and Recycles with hydrothermal water (Prof. Masaru WATANABE)		7-1. Basics of hydrothermal water process		
14	7/17			7-2. Application of hydrothermal water process for biomass refinery and recycle		
Preparation		Knowledge of organic chemistry and biochemistry will be required.				
Record and evaluation method		Students will be evaluated based on: class attendance, examinations and/or reports depending on topics. No make-up exam.				
Textbook and references		-				
Self study		-				
In addition		-				