

Subject (English)	Chemical and Biomolecular Engineering I		Semester	Spring	Day/Slot	Thu./2 <sup>nd</sup> 10:30-12:00
科目名 (日本語)	化学・バイオ工学 I					
Course Code	TB37011	Course Numbering	TCH-MAC303		Period	Apr. 11 – Jul. 25, 2019
Instructor (Post)	Yuji Matsumoto, <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						
We are surrounded by a large number of chemical products manufactured with various types of materials including organic, inorganic and their composite materials. Even in our body, biological materials are constantly being produced using a variety of chemical and biochemical reactions. The present course objective is to provide chemistry-oriented topics in developing such functional materials in various areas.						
Keywords	-					
Goal of study						
Students will learn some basic aspects of chemical production, with special emphasis on how environment-friendly synthetic methodologies of materials have been developed for new advanced products.						
Contents and progress schedule of class						
No	Date	Topics				
1	4/11	1. Chemistry of materials processing in vacuum	1-1. Basic vacuum technology for materials processing			
2	4/18		1-2. Vacuum deposition techniques of inorganic and organic thin film materials			
3	4/25	2. Chemical functions of coordination compounds	2-1. Basic concepts of coordination chemistry			
4	5/9		2-2. Applications to functional materials and biomedicine			
5	5/16	3. Chemistry of composite materials in wet processing	3-1. Wet chemical processing for composite particles and thin films			
6	5/23		3-2. Controls over sizes and morphologies of composite particles			
7	5/30	4. Particle dynamics in nanofluids	4-1. Aggregation / dispersion of particles			
8	6/6		4-2. Aggregation kinetics and colloidal dynamics			
9	6/13	5. Fine synthetic organic chemistry using metallic reagents	5-1. Carboxylation reactions with carbon dioxide			
10	6/20		5-2. Synthesis and use of cyclic functional molecules			
11	6/27	6. Catalytic production of chemicals from biomass	6-1. Production of pure platform chemicals from biomass			
12	7/4		6-2. Conversions of biomass-derived platform chemicals			
13	7/11	7. Chemistry of Carbon Nanomaterials	7-1. Structure and bonding in organic molecules			
14	7/18		7-2. Fullerenes, carbon nanotubes and graphene			
15	7/25	Examination				
Preparation	Knowledge on fundamental chemistry is required.					
Record and evaluation method	Examinations and/or reports, depending on topics. No make-up exam.					
Textbook and references	None. The handout and/or prints will be delivered by each instructor in his/her class.					
Self study	-					
In addition	-					