Course Title		Introduction to Science and Engineering of Material for Energy
Registration Code		L100060001
Number of Credits		2
Years of Eligible Graduate Students		1-2
Period		2nd
room		Monday 4th
Room		B5-1B33 (Nakamozu Campus, OPU), B115 (CPU: Distant lecture)
Instructors		Atsushi Ashida, Akinori Mutou and Hayato Tokumoto
Office hours		
Goals of the course		Goals of the course is that the students understand the relationship between the present situation of resource utilization and the global cycle of materials from the viewpoint of engineering and bio resource, considering resource utilization and the environment globally. Besides, We aim that the students can acquire the ability to build a new substance production process, based on this viewpoint.
Textbooks		Printed matters will be distributed.
Books of reference		D.T. Allen and K.S. Rosselot: “Pollution Prevention for Chemical Processes”, John Willey & Sons, Inc. (1997)
Allied subject		
Homework (Preparing for the classwork)		
		Students must think about the assignments and exercises to be presented in the class, and submit reports according to the instruction.
Course outline		We give an outline of the relationship between the present situation of resource utilization and the material circulation on the global scale, on considering resource utilization and environment globally. We also lecture about basic matters, the process engineering approach to cycle systems, and recycling techniques of various waste which are necessary to establish a sustainable resource utilization/material cycle system. In addition, we learn about the topics concerning the material cycle and carry out discussion about them.
Class schedule	1st	What is a resource?
	2nd	Ecosystem and material cycle
	3rd	Ecosystem and material cycle
	4th	Material flow and cycling resources in our country
	5th	Material flow and cycling resources in our country
	6th	Material flow in industry and nature
	7th	Material flow in industry and nature
	8th	Flow/cycle of industrial ecology
	9th	Environmental conformity design of processes and products
	10th	Residual components in industrial processes and the minimization thereof
	11-15th	Topics concerning material cycle
Evaluation		Report (100%) Based on the results of quizzes and reports.