

Technology of Environment & Energy

Special Subjects
Elective 2 credit

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1. Course Description

In this course, students will learn that the natural purification capacity of the Earth which was thought as infinite has been lost by the human rich life and the expansion of our economic activity to understand the current status of the environment for human to survive. And the finite reserves of fossil fuel, which has contributed to the development of civilization and which plays a big role in influencing the Global Environment, are understood by learning the energy which has supported our life and economic activity.

Next, we take a detailed look at renewable energy, namely solar, wind and so on which can contribute to the human's living environment and to the creation of advanced and intellectual future civilization. We shall also discuss the characteristics of atomic energy. We, moreover, see the convenience of automobile which is the product of modern civilization.

Finally, we think about social and technical measures for realization of the future low carbon society.

To improve their presentation skills, each student will give a presentation about a environment-related subject which is selected by the students, and group discussions for the presentation will be held with participants in this course.

Students can acquire the knowledge, skill and behavior for DP1 to DP6 by this lecture.

Each lectures have been designed flexible, based by Covid-19 pandemic situation.

2. Course Objectives

This course deals with Destruction of Local and Global Environments at the hand of human beings and the crisis of survival of the human race. We will also talk about problems of modern civilization created by mankind. Countermeasure through engineering will be explored as a way for the human race to survive.

Objectives of this course are to understand and learn about renewable energy (new energy) as a way of improving our environmental footprint, especially about the resources and energy contributing to human activities.

Additional objectives of this lecture are to acquire knowledge regarding management of environmental technology and to plan and create the image of the future society system with automobile for realizing the low carbon society.

3. Grading Policy

Evaluation will be carried out by sum total of the result(40%) of a exercise & report and the result(60%) of presentation and discussion in the lecture.

Students will get the feedback of the evaluation for their report on this lecture by comments and explanation.

4. Textbook and Reference

Textbook

Katsuzo Yamaguchi et al 『Science of Environment, the third edition, Our Earth and The Earth in the Future 』 Baifukan Co.,Ltd.

Reference

PEL(Professional Engineer Library 『Environmental Engineering』 Jikkyo Publishing Co. Ltd.

『Annual Report on the Environment in Japan in 2020』 Ministry of Environment in Japan

5. Requirements(Assignments)

Not only to improve understanding and proposal potential, but also communication and presentation skills will be acquired through this lecture.

The Exchange report of reflection is carried out in every class in this course, in order to communicate with teacher.

Also, please make an effort to submit the report in each lectures.

6. Note

7. Schedule

- [1] Problems of Local and Global Environment and its history
- [2] Global Warming (Group Work)
- [3] Challenges for overcome to finiteness of resources and Fossil Fuel (Group Work)
- [4] Atomic Energy (Group Work)
- [5] Solar Energy (Group Work)
- [6] Wind Energy (Group Work)
- [7] Waste & Biomass energy (Group Work)
- [8] Water/Ocean/Geothermal Energy and Unused Energy (Group Work)
- [9] Presentation & Discussion (No.1)
- [10] Clean Energy Vehicle and Co-generation System (Group Work)
- [11] Fuel Cell and Technology for usage of Low Heat Energy (Group Work)
- [12] Revolution in Transportation Systems and Energy Saving & Low Carbon System of Buildings (Group Work)

- [13] Smart Energy Network System and Introduction & Evaluation Method of Energy (Group Work)
- [14] Presentation & Discussion (No.2)
- [15] Summary (Group Work)