Course number	U-LAS13 10022 LE60		
Course title (and course title in English)	Chemistry of Sustainable Energy-E2 Chemistry of Sustainable Energy-E2	Instructor's name, job title, and department of affiliation	Institute of Advanced Energy Senior Lecturer,ARIVAZHAGAN RAJENDRAN

Group	Natural Sciences	Field(Classification)	Chemistry(Foundations)

Language of instruction	English	Old group	Group B	Number of credits	2

Number of weekly time blocks	1	Class style	Lecture (Face-to-face course)	Year/semesters	2026 • Second semester

Days and periods	Tue.3	Target year	All students	Eligible students	For science students

[Overview and purpose of the course]

We explore the fundamental principles and applications of sustainable energy from a chemical perspective. The course introduces the concept of sustainable energy, which aims to provide an inexhaustible energy supply while minimizing the emission of greenhouse gases into the atmosphere. Topics include solar, wind, geothermal, and biomass energy, as well as photocatalysis, environmental remediation, and materials for sustainable energy conversion.

[Course objectives]

The goal of this course is to develop a foundational understanding of materials related to renewable energy and to grasp the mechanisms of energy conversion that support a sustainable future.

[Course schedule and contents)]

1. What is sustainable energy?
2. Solar energy: Inorganic solar cells
3. Solar energy: Organic solar cells
4. Solar energy: Dye-sensitized and quantum dot solar cells
5. Wind energy: Types of wind turbines
6. Wind energy: How wind turbines work?
7. Geothermal energy: Direct use of geothermal energy
8. Geothermal energy: Geothermal power generation
9. Biomass energy: Thermochemical conversion
10. Biomass energy: Biochemical conversion
11. Photo-catalyst: Air purification and sterilization
12. Photo-catalyst: Water purification
13. Materials: Structure and thermal insulation
14. Materials: Polymers and sustainable energy
15. Assignment which is considered as a term examination
16. Feedback

[Course requirements]

None

[Evaluation methods and policy]

Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment which is considered as a term examination (50%).

Continue to Chemistry of Sustainable Energy-E2(2)↓↓↓

Chemistry of Sustainable Energy-E2(2)

[Textbooks]

Nancy E. Carpenter 『Chemistry of Sustainable Energy』 （CRC Press）ISBN:978-1-4665-7532-5

[References, etc.]

（References, etc.）

Introduced during class

[Study outside of class (preparation and review)]

It is recommended that students review the key points to be learned.

[Other information (office hours, etc.)]

Office hours are scheduled for Fridays, 15:00-17:00.

[Essential courses]