

Course number	U-LAS13 10004 LE60					
Course title (and course title in English)	Basic Physical Chemistry (thermodynamics)-E2 Basic Physical Chemistry (thermodynamics)-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	2025 • First semester
Days and periods	Mon.3	Target year	Mainly 1st & 2nd year students		Eligible students	For science students
[Overview and purpose of the course]						
We learn about the thermodynamics in the state-change of matter, also in the chemical reactions. Contents of the lecture covers the following fields of change of state, thermodynamic laws, definition of the quantities (enthalpy, entropy, free energy, chemical potential), chemical equilibrium, and reaction kinetics. Aim of this course is the understanding of these concepts.						
[Course objectives]						
The aim of this class is to understand the basic principles of thermodynamics.						
[Course schedule and contents)]						
1. Change of the system and quantity of state 2. Thermal energy and work 3. 1st law of thermodynamics: Change of internal energy and enthalpy 4. Chemical reaction and thermal energy 5. Interpretation of internal energy in molecular level 6. Change of state of the ideal gas 7. 2nd law of thermodynamics: Entropy 8. Entropy change in the change of state 9. 3rd law of thermodynamics: Conversion from heat to work 10. Gibbs energy 11. Change of the Gibbs energy when temperature and pressure change 12. Chemical potential 13. Change of state and chemical potential change of matter 14. Chemical equilibrium and rate of chemical reaction 15. Term examination						
[Course requirements]						
None						
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Basic Physical Chemistry (thermodynamics)-E2(2)

[Evaluation methods and policy]

Results will be evaluated by the submission of homework written in English (30%), attendance and discipline (20%), and assignment (50%).

[Textbooks]

Yunus A. Cengel and Michael A. Boles 『Thermodynamics: An Engineering Approach, 8th Edition in SI Units』 (McGraw-Hill Education) ISBN:978-981-4595-29-2

Peter Atkins and Julio de Paula 『Atkins' Physical Chemistry, 10th Edition』 (Oxford University Press) ISBN:978-0-19-969740-3

[References, etc.]

(References, etc.)

Introduced during class

[Study outside of class (preparation and review)]

I recommend that the students should review the points to be learned.

[Other information (office hours, etc.)]

Office hours are set at 15:00-17:00 in every Friday.

[Essential courses]