

Course number	U-LAS13 10002 LE60				
Course title (and course title in English)	Essentials of Basic Physical Chemistry-E2 Essentials of Basic Physical Chemistry-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 • First semester
Days and periods	Tue.2	Target year	All students	Eligible students	For science students
[Overview and purpose of the course]					
We learn about the structure, properties and reactions of matters for the base of physical chemistry. Contents are covered by following fields of the structure and properties of the atom and molecules, quantum chemistry, thermodynamics, and chemical reactions. Aim of this course is the understanding of these concepts.					
[Course objectives]					
The aim of this class is to understand the basic principles of physical chemistry for beginners.					
[Course schedule and contents]					
<ol style="list-style-type: none"> 1. Basics and units of chemistry 2. Structure and property of the atom: Bohr's atomic model 3. Structure and property of the atom: Electronic waviness and orbit function 4. Structure and property of the atom: Electron configuration and periodic table 5. Structure and property of the atom: Ionization energy and electron affinity 6. Molecules: Covalent bonds (s and p-bonds), hybrid orbitals 7. Molecules: Coordinate bond 8. Molecules: Ionic bonds, van der Waals force, and hydrogen bond 9. Thermodynamics: 1st & 2nd law of thermodynamics and phase diagram 10. Chemical equilibrium: Equilibrium constant and Le Chatelier's principle 11. Chemical equilibrium: A rate equation and reaction mechanism 12. Oxidation and reduction: Oxidation state and battery 13. Acid and base: Definition and dissociation equilibrium 14. Acid and base: Neutralization titration, hydrolysis, and buffer solution 15. Assignment which is considered as a term examination 16. Feedback 					
[Course requirements]					
None					
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[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%).

[Textbooks]

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.

The students, who have not studied high-school physics, can take this lecture, it is desired that they should make up for the knowledge lacked by self-study and inquiry to the teacher after lectures or in office hour.

[Other information (office hours, etc.)]

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

[Essential courses]

Faculty of Science