科目ナンバリング	U-LAS13 10002 LE60				
授業科目名<英訳>	Essentials of Basic Physical Chemistry-E2 Essentials of Basic Physical Chemistry-E2	担当者所属職名・氏名	エネルギー理工学研究所 講師	ARIVAZHAGAN RAJENDRAN	
群	自然科学科目群	分野(分類)	化学(基礎)	使用言語	英語
旧群	B群	単位数	2単位	週コマ数	1コマ	授業形態	講義（対面授業科目）
開講年度・開講期	2026・前期	曜時限	火2	配当学年	全回生	対象学生	理系向

[授業の概要・目的]

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.

[到達目標]

The aim of this class is to understand the basic principles of physical chemistry for beginners.

[授業計画と内容]

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

[履修要件]

特になし

[成績評価の方法・観点]

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%).

Essentials of Basic Physical Chemistry-E2(2)へ続く↓↓↓

Essentials of Basic Physical Chemistry-E2(2)

[教科書]

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

[参考書等]

（参考書）
授業中に紹介する

[授業外学修（予習・復習）等]

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.

[その他（オフィスアワー等）]

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

[主要授業科目（学部・学科名）]

理学部