科目ナンバリング	U-LAS13 10030 LE60				
授業科目名<英訳>	Outline of Chemistry I(Its History and Fundamentals)-E2 Outline of Chemistry I(Its History and Fundamentals)-E2		担当者所属職名・氏名	工学研究科　准教授　GAO，Si	
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・後期	曜時限	木2	配当学年	主として1・2回生	対象学生	全学向

[授業の概要・目的]

All matter in the nature world is composed of one or more substances called elements. Human beings use variety kinds of matter to create materials that can be used for certain purpose. This course intends to give an introduction to the first and second year students on the fundamental elements and matter in the nature world, as well as the man-made materials composed of those elements, such as metals, ceramics and polymers which are quite important to modern society.

[到達目標]

Students are expected to learn the basic knowledge of elements, matter in the nature world. Moreover, they will learn various kinds of materials that can be seen in our daily life and realize how important they are to the modern society.

[授業計画と内容]

Week 1: Atom and elements
Basic concept of atoms is introduced in this part. Such as atomic number, atomic weight, atomic size, etc.
Week 2: Periodical table of the elements
In this part we will learn what periodical table is and how to use it to derive relationships between various elements properties.
Week 3-12: From elements to matters and materials
In this part we will firstly introduce the important elements and the matter composed of them. After that, materials composed of those elements, which are being used in our modern society are to be introduced. For example, iron (Fe) and carbon (C) in steels, aluminum (Al) and magnesium (Mg) in aluminum alloys; copper (Cu) in electrical conductor, Gadolinium (Gd) in magnetic material, Lithium (Li) in battery, Si and semiconductor materials are to be introduced. Oxygen (O) Nitrogen (N) and carbon (C) in ceramics, carbon (C) and hydrogen (H) in polymers will also be introduced. In addition, the relationship between the structure, processing and the properties of the above mentioned materials will to be introduced, which is the core of materials science.
Week 13-14: How to identify and analyze the elements and materials?
In this part we will introduce the characterization techniques, such as spectroscopy and electron microscopy, by which we can identify the elements or visualize the atoms and microstructures of the materials.
Week 16: Feedback.

[履修要件]

特になし

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[成績評価の方法・観点]

Attendance and class participation[70%]
Short reports [30%]

[教科書]

使用しない

[参考書等]

（参考書）

Theodore Gray 『The Elements 』（Encyclopaedia Britannica）ISBN:1615354328

[授業外学修（予習・復習）等]

Students are required to read assigned materials (distributed by the teacher) before the class for preparation and write short reports after class for review. The necessary time for those would be around 1.5 hours for each class.

[その他（オフィスアワー等）]

[主要授業科目（学部・学科名）]