科目ナンバリング	U-LAS13 10012 EE60						
授業科目名<英訳>	Fundamental Chemical Experiments-E2 Fundamental Chemical Experiments-E2			担当者所属職名・氏名	人間・環境学研究科 基礎化学実験授業担当教員 工学研究科 講師 LANDENBERGER, Kira Beth 工学研究科 准教授 Tong Zhu 工学研究科 准教授 Juha Lintuluoto 工学研究科 准教授 Yi Wei 工学研究科 講師 Nguyen Thanh Phuc 工学研究科 教授 Cathy McNamee		
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	2コマ	授業形態	実験（対面授業科目）
開講年度・開講期	2026・後期	曜時限	水3・4/金3・4	配当学年	主として1回生	対象学生	理系向

[授業の概要・目的]

The purpose of this laboratory class is to practice the basic identification and synthesis of chemical compounds as well as to learn the underlying principles involved.

[到達目標]

Students will gain understanding in basic chemical concepts by actual hands-on work performing fundamental analysis and synthesis of chemical compounds.

[授業計画と内容]

Registration information: https://www.z.k.kyoto-u.ac.jp/zenkyo/guidance

1. General Guidance [2 times]
The aims and contents of the experiments, how to make laboratory notes and reports, and how to use experimental instruments, labware and reagents safely.

2. Qualitative Inorganic Analysis Experiments [4 times]
(1) Basic Reactions of Fe3+ and Al3+ (3rd Analytical Group).
(2) Basic Reactions of Ag+, Pb+, Cu2+ and Bi3+ (1st and 2nd Analytical Groups).
(3) Basic Reactions of Ni2+, Co2+, Mn2+ and Zn2+ (4th Analytical Group).
(4) Analysis of an Unknown Sample Containing Some Cations.

3. Volumetric Analysis Experiments [4 times]
(1) Chelatometric Titration: Quantitative Determinations of Ca2+ and Mg2+ in tap water.
(2) Iodometry: Quantitative Determination of NaClO in Bleach.
(3) Oxidation Reaction Rate: Measurement of a Pseudo-first-order Reaction Rate Constant.
(4) Adsorption of Oxalic Acid by Activated Carbon.

4. Experiments in Organic Chemistry [4 times]
(1) Qualitative Analysis of Organic Compounds.
(2) Structure and Property of Organic Compounds: Azo Dyes and Fluorescent Dyes.
(3) Organic Synthesis I: Acetylation of 4-Methoxyaniline.
(4) Organic Synthesis II: Nitration and Hydrolysis.

5. Feedback [1 time]

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Fundamental Chemical Experiments-E2(2)

[履修要件]

特になし

[成績評価の方法・観点]

Grades will be based on submitted reports and performance during of a total of 12 hands-on chemical experiments.

[教科書]

『Fundamental Chemical Experiments』（This textbook will be delivered at the class.）

（関連ＵＲＬ）

https://ocw.kyoto-u.ac.jp/en/ilas/02(Video materials for chemical operation.)

[授業外学修（予習・復習）等]

Preparation for each experiment should be done in advance. Understand the principles involved, and summarize these beforehand in the experimental notes regarding the reagents, equipment, and procedures and methods to be used.

[その他（オフィスアワー等）]

・For the registration of the class, please see *1 below.
・Detailed information of the registration will be given at the homepage“ KULASIS ”in mid-September.
・Attend the first class, the course guidance will be given there.
・When you decide to take the class, you must have your own safety glasses as well as obtain the insurance for study and research“**学生教育研究災害傷害保険**”. (Safety glasses can be purchased at the COOP Shop“**生協**”and the insurance“**学生教育研究災害傷害保険**”is processed at the Education Promotion and Student Support Department Desk ”**教育推進・学生支援部**”.)

*1
Students must apply for the course before registration if they intend to register for experiment or exercise class of Natural Sciences Group. Please register for the class if you are permitted to participate.
・Application period:
Before the guidance of the first class
・Posted:
Details will be posted on“ Notification ”(Academic affairs information on liberal arts and sciences) in KULASIS in mid-September.
・Application method:
This will be explained in the“ Notification ”on KULASIS
・Selection method:
If the number of students who wish to take the class exceeds the course limit, a lottery will be held. The results will be announced after the guidance session.

・Notice: Unlike the other class designated courses, students can register the“ Fundamental Chemical Experiments ”course even if it is not the day/period of their class designated course. However, this shall not apply in the case when the class is oversubscribed.

[主要授業科目（学部・学科名）]

理学部