科目ナンバリング	U-LAS13 10040 LE60				
授業科目名<英訳>	Analytical Chemistry and Forensic Science-E2 Analytical Chemistry and Forensic Science-E2	担当者所属職名・氏名	化学研究所　講師　MURDEY, Richard James		
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	月5	配当学年	主として1・2回生	対象学生	理系向

[授業の概要・目的]

This course introduces key concepts and methods in analytical chemistry using practical examples from forensic science. Lectures are based on case studies and feature mock crime scene investigations. Students will learn how to detect and identify substances like drugs, poisons, explosives, blood, and DNA. Analytical methods are covered including gas chromatography (GC), mass spectrometry (MS), high-performance liquid chromatography (HPLC), thin layer chromatography (TLC), immunoassays, atomic absorption/atomic emission (AA/AE), inductively coupled plasma emission (ICP/AES) and mass spectrometry (ICP/MS), scanning electron microscopy (SEM), Fourier transform infrared spectrometry (FTIR), ultraviolet/visible spectrometry (UV/Vis), and electrophoresis. Concepts such as chain of custody and quality assurance / quality control are presented.

[到達目標]

This course provides a basic understanding of the methods and techniques used in analytical chemistry.

[授業計画と内容]

1. Introduction to forensic science
2. Drug identification
3. Confirmatory methods for drug identification
4. Toxicology
5. Fingerprints
6. Fluorescence detection
7. Sample preparation for biological specimens
8. Serology
9. Fire and arson
10. Explosives
11. Blood enzymes and proteins
12. DNA analysis I
13. DNA analysis II
14. Paint, hair, and fiber analysis
15. [exam period]
16. Feedback

[履修要件]

特になし

Analytical Chemistry and Forensic Science-E2(2)へ続く↓↓↓

Analytical Chemistry and Forensic Science-E2(2)

[成績評価の方法・観点]

Each lecture will introduce a short homework assignment related to the topic covered. These assignments count for 70% of the final grade, and class participation counts for the remaining 30%. There is no final exam.

[教科書]

使用しない

[参考書等]

（参考書）

Gary D. Christian, Purnendu K. Dasgupta, Kevin A. Schug 『Analytical Chemistry』
Kelly M. Elkins 『Introduction to Forensic Chemistry』
Mat H. Ho 『Analytical Methods in Forensic Chemistry』
These textbooks may be helpful as references or for self-study.

[授業外学修（予習・復習）等]

Weekly assignments reinforce key concepts introduced in each lecture.

[その他（オフィスアワー等）]

[主要授業科目（学部・学科名）]