科目ナンバリング	U-LAS70 10002 SE50						
授業科目名<英訳>	ILAS Seminar-E2 :Smart Materials (Innovations in Materials Chemistry)（スマートマテリアル-材料化学の革新） ILAS Seminar-E2 :Smart Materials (Innovations in Materials Chemistry)			担当者所属職名・氏名	工学研究科　講師　LANDENBERGER, Kira Beth		
群	少人数群	単位数	2単位	週コマ数	1コマ	授業形態	ゼミナール（対面授業科目）
開講年度・開講期	2026・前期	受講定員(1回生定員)	25 (15) 人	配当学年	主として1回生	対象学生	全学向
曜時限	木5	教室	1共21			使用言語	英語
キーワード	Structural materials and functional materials / stimuli responsive materials / self-healing / shape memory / mimicking nature						

[授業の概要・目的]

Students will be equipped with a basic understanding of what "smart materials" are and how these materials are present both in current research and the world around them. Students are encouraged in this course to be more creative in their own future studies and potential research in any of the sciences. The course will focus on basic stimuli-sensitive materials in the beginning and then on smart material systems in the second half of the class.

[到達目標]

Students will be provided with a broad overview and introduction to “smart materials” as present in current research and current applications. The research topics will consider various “smart materials” including stimuli-responsive materials, drug delivery systems, self-healing materials, shape memory materials and various biomimetic systems. Students will be asked to engage in the course material more fully by preparing a semester project as well as completing occasional tasks outside of class throughout the semester.

[授業計画と内容]

1.Introduction to Smart Materials
2.Thermoresponsive Materials
3.Light Responsive Materials
4.Magnetic Materials
5.Piezoelectric Materials
6.Ion, pH and Electroresponsive Materials
7.Research and Presentations Methods
8.Self-Healing Materials
9.Shape Memory Materials
10.Drug Delivery Systems
11-12.Biomimetic Materials (2 Seminars)
13-14.Smart Surfaces (2 Seminars)
Final Presentations (instead of a final exam; depending on the number of students and the needs of the course this will take place over the exam and/or the feedback session)
15.Feedback

ILAS Seminar-E2 :Smart Materials (Innovations in Materials Chemistry) (スマートマテリアル-材料化学の革新) (2/4)続く↓↓↓

ILAS Seminar-E2 :Smart Materials (Innovations in Materials Chemistry) (スマートマテリアル-材料化学の革新) (2)

[履修要件]

特になし

[成績評価の方法・観点]

Class attendance and participation (45%), homework (10%) and a semester presentation (45%).

[教科書]

使用しない

Handouts will be provided as necessary.

[参考書等]

（参考書）

Mel Schwartz 『Smart Materials』（CRC Press）ISBN:9781420043723（A useful resource for the course）

Xu Hou 『Design, Fabrication, Properties and Applications of Smart and Advanced Materials』（CRC Press）ISBN:9781498722483（A useful resource for the course）

[授業外学修（予習・復習）等]

Students will be asked to prepare a short oral presentation for the end of the semester. Additionally, to encourage students to engage with the course material throughout the semester, short assignments will occasionally be given.

[その他（オフィスアワー等）]

Office hours by request.

[主要授業科目（学部・学科名）]