Course number	U-LAS70 10002 SE50				
Course title (and course title in English)	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)	Instructor's name, job title, and department of affiliation	Graduate School of Engineering Senior Lecturer,LANDENBERGER, Kira Beth		
Group	Seminars in Liberal Arts and Sciences	Number of credits	2	Number of weekly time blocks	1
Class style	seminar (Face-to-face course)	Year/semesters	2025・First semester	Quota (Freshman)	25 (15)
Target year	Mainly 1st year students	Eligible students	For all majors	Days and periods	Thu.5
Classroom	26, Yoshida-South Campus Bldg. No. 1			Language of instruction	English
Keyword	Structural materials and functional materials / stimuli responsive materials / self-healing / shape memory / mimicking nature				

[Overview and purpose of the course]

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.

[Course objectives]

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.

[Course schedule and contents)]

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

Continue to 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)↓↓↓

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)

[Course requirements]

None

[Evaluation methods and policy]

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

[Textbooks]

Not used
Handouts will be provided as necessary.

[References, etc.]

（References, etc.）

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）

[Study outside of class (preparation and review)]

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.

[Other information (office hours, etc.)]

Office hours by request.