

Course number		U-LAS70 10002 SE50					
Course title (and course title in English)	ILAS Seminar-E2 :Introduction to Engineering in Biology and Medicine (医工学の基礎)		Instructor's name, job title, and department of affiliation	Institute for Life and Medical Sciences Assistant Professor,KIM, Young Kwan			
	ILAS Seminar-E2 :Introduction to Engineering in Biology and Medicine						
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	2024 ・ First semester		Quota (Freshman)	10 (10)
Target year	Mainly 1st year students	Eligible students	For all majors		Days and periods	Wed.5	
Classroom	32, Yoshida-South Campus Bldg. No. 1				Language of instruction	English	
Keyword	Biology / Medicine / Engineering						
[Overview and purpose of the course]							
Solving current societal issues demands integrating ideas and taking a multifaceted approach. Integrating engineering, biology and medicine, this seminar aims at introducing students to multidisciplinary approaches to understanding and/or solving complex issues in biology, medicine and/or engineering. Discussions will be centered on understanding multidisciplinary approach toward solving the said problem by integrating knowledge and concepts from various disciplines (science, engineering and/or medicine).							
[Course objectives]							
To nurture interests in knowledge integration from diverse scientific disciplines. To learn how to integrate knowledge and concepts toward application to solving complex open-ended questions in biology, medicine and/or engineering.							
[Course schedule and contents)]							
This seminar will tackle selected topics related to application of engineering principles and knowledge to solving clinical problems, and/or elucidating known and unknown biological phenomena. Besides discussions, students will have opportunities to make some short presentations on topics of interest. Topics might be flexibly changed based on our interests.							
1) Recent exciting discoveries in science (3 weeks) We will begin the discussion series by exploring ground-breaking discoveries in science and discuss their impacts on the society. Through this session, we will learn how to obtain fundamental knowledges from scientific articles.							
2) Engineering in biology (3 weeks) We will discuss the convergence of biology with engineering that have enabled the manipulation, analysis and detailed study of living systems including biomechanics, tissue engineering, sequencing technologies, and other biotechnologies.							
3) Engineering in medicine (4 weeks) We will discuss trends in medical engineering and specific application in areas such as drug development,							
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surgical tools, visualization technologies, and other medical technologies.

4) Emerging areas in engineering for biology and medicine (3 weeks)

Recent explosive advances in science are causing revolutionary developments in medicine and biology. One such technology is "in silico" technologies, such as AI and simulation. Here, we will discuss emerging trends in "in silico" technologies for biology and medicine, and highlight their potential applications.

5) Student presentations (2 weeks)

6) Lecture review (1 week)

[Course requirements]

None in particular. The seminar will be discussion-based.

[Evaluation methods and policy]

Attendance and active class participation 60%, Discussions and Presentations: 40%

[Textbooks]

Not used

[References, etc.]

(References, etc.)

Handouts may be given out.

[Study outside of class (preparation and review)]

Prior reading of scientific papers on topics to be discussed is recommended to enhance understanding.

[Other information (office hours, etc.)]