

<b>Course number</b>	U-LAS70 10002 SE50				
<b>Course title (and course title in English)</b>	ILAS Seminar-E2 :Physics of Life ( 生命の物理学 ) ILAS Seminar-E2 :Physics of Life	<b>Instructor's name, job title, and department of affiliation</b>	Graduate School of Science Associate Professor, DECHANT , Andreas		
<b>Group</b>	Seminars in Liberal Arts and Sciences	<b>Number of credits</b>	2	<b>Number of weekly time blocks</b>	1
<b>Class style</b>	seminar (Face-to-face course)	<b>Year/semesters</b>	2025 · Second semester	<b>Quota (Freshman)</b>	15 (15)
<b>Target year</b>	Mainly 1st year students	<b>Eligible students</b>	For all majors	<b>Days and periods</b>	Wed.5
<b>Classroom</b>	02, Yoshida-South Campus Academic Center Bldg. West Wing			<b>Language of instruction</b>	English
<b>Keyword</b>	Science / Physics / Biology				
<b>[Overview and purpose of the course]</b>					
<p>The purpose of this seminar is to learn about the various ways in which physics can be used to understand living matter, from the motion of small molecular machines in the cells of our bodies to the collective behavior of swarms of animals. We will also learn how the physical description of living matter can allow us to emulate it to develop new materials and devices.</p> <p>In this seminar, we will learn about selected topics in biophysics by reading articles from scientific journals. For each topic, we will start with one or two weeks of lectures explaining the necessary background. After that, we will read a scientific article together. We will discuss the contents of the article and its importance for the field of biophysics. The following week, some students will be asked to give a brief presentation about a part of last week ' s article.</p>					
<b>[Course objectives]</b>					
<ul style="list-style-type: none"> <li>- Understanding how living matter is different.</li> <li>- Becoming familiar with some of the techniques currently used in biophysics.</li> <li>- Learning to read scientific articles and present their contents.</li> </ul>					
<b>[Course schedule and contents]</b>					
<p>Class 1-3: Motion and machines at small scales.  Class 4-6: Biological and artificial molecular motors.  Class 7-9: Randomness, noise, and fluctuations.  Class 10-11: Collective motion and swarming.  Class 12-14: Polymers and DNA.  Class 15 : Feedback</p>					
<b>[Course requirements]</b>					
Knowledge about statistical mechanics and/or thermodynamics is helpful but not required.					
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**[Evaluation methods and policy]**

The students will be graded based on their participation in class (25%) and their presentation (75%). Students will need at least 60% in total to pass.

**[Textbooks]**

No textbook, articles will be given as handouts.

**[Study outside of class (preparation and review)]**

Each student will be asked to prepare a short presentation on a part of a scientific article once during the course.

**[Other information (office hours, etc.)]**

Office hour: Thu. 15:00-16:00

**[Essential courses]**