

Course number		G-LAS11 80006 LB79					
Course title (and course title in English)	応用生命科学VI Applied Life Sciences VI				Instructor's name, job title, and department of affiliation	Research Institute for Sustainable Humanosphere Professor, UMEZAWA TOSHIAKI Graduate School of Agriculture Associate Professor, KOBAYASHI MASARU	
Group	Interdisciplinary Graduate Courses			Field(Classification)		Natural Sciences	
Language of instruction	Japanese and English			Old group		Number of credits 1	
Hours	15	Class style	Lecture (Face-to-face course)		Year/semesters	2024・Intensive, Second semester	
Days and periods	Intensive 3rd to 5th periods on October 26, November 2 and 9		Target year	Graduate students	Eligible students	For science students	
(Students of Graduate School of Agriculture cannot take this course as liberal arts and general education course. Please register the course with your department.)							
[Overview and purpose of the course]							
Plants are recognized as the Producer in the Ecosystem, where plants convert inorganic C, N, and S into organic molecules such as sugars, lipids and proteins, which are the foodstuff for animals and microorganisms. Not only the foodstuff, plants supply us wood as fuel and house construction materials, and fibers and papers. In this lecture, we will introduce the mechanisms in plant cells, especially, photosynthesis and nitrogen assimilation, and cell wall, lignin and secondary metabolites synthesis.							
【研究科横断型教育の概要・目的】 In Applied Life Sciences I-VI, we take a chemically based view of biological phenomena and attempt to explain them in chemical terms. From each subject, we can obtain fundamental and applied knowledges and technologies of life sciences.							
[Course objectives]							
Students are expected to acquire the outline of 1) plant nutrition physiology, and 2) plant secondary metabolism and structures/formation of plant secondary cell wall.							
[Course schedule and contents)]							
1, 2, 3 Photosynthesis: Conversion of light energy to chemical energy, and the assimilation of carbon using the energy are explained.							
4, 5, 6 Nitrogen and sulfur assimilation: Pathways via which inorganic nitrogen (nitrate and ammonium ions) and sulfur (sulfate ion) are assimilated are explained.							
7, 8, 9 Cell wall synthesis and function: Plant cell wall is the most abundant renewable biomass on the earth. The structure, chemical components, and biosynthetic mechanisms of plant cell wall are explained. Especially, lignin biosynthesis is explained in detail.							
10, 11 Tree biology and biochemistry: Biology and biochemistry which are specific to trees are explained.							
12, 13, 14 Plant secondary metabolites: Plants produce a large number of secondary metabolites. The biosynthesis of the metabolites is explained.							
15 Feed back. If students have any questions and would like to have deeper discussion with instructors, students are welcome at laboratories.							
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応用生命科学VI(2)

This lecture will be given intensively on afternoon of two to three Mondays.

[Course requirements]

This lecture is given in English.

[Evaluation methods and policy]

Credit is evaluated on a short essay for selected topics.

[Textbooks]

Not used

[References, etc.]

(References, etc.)

Introduced during class

[Study outside of class (preparation and review)]

Homework will be assigned in the class.

[Other information (office hours, etc.)]

Office hour: Every day later than 17:00 at Room N228