

平成29年度研究科横断型教育プログラム（Aタイプ）授業科目

開講方式	Aタイプ (研究科 開講型)	研究科名	農学研究科	カテゴリー	自然科学総合科目群	横断区分	理系横断型				
授業科目名 (英訳)	応用生命科学 VI Applied Life Sciences VI		講義担当者 所属・職名・ 氏名	農学研究科 教授 間藤 徹 生存圏研究所 教授 梅澤 俊明		開講場所	農学部総合館				
配当学年	修士	単位数	1単位	開講年度・開講期	後期 集中	曜時限	月曜3・4・ 5限(13:00 -18:00)	授業形態	講義	使用言語	日本語 及び英語
〔授業の概要・目的〕											
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.											
〔到達目標〕											
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.											
〔授業計画と内容〕											
1,2 Photosynthesis1: Plant chloroplasts decompose H ₂ O into H ⁺ , electron and O ₂ under sunlight. The mechanism of electron transfer from water to NADPH is explained. 3,4 Photosynthesis 2: In chloroplasts, generated H ⁺ and electrons through photosynthesis are converted to NADPH and ATP, and they are utilized as an energy source for assimilation reactions, such as CO ₂ to sucrose. The chloroplastic assimilatory pathway is explained in detail. 5,6 Nitrogen and sulfur assimilation: Plants convert inorganic NO ₃ ⁻ and NH ₄ ⁺ into amino acids, and SO ₄ ²⁻ to cystein. The pathways for amino acid production is explained. 7,8,9 Cell wall synthesis: 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. This lecture will be given intensively on afternoon of two to three Mondays.											
〔履修要件〕											
This lecture is given in English.											
〔成績評価の方法・観点及び達成度〕											

Credit is evaluated on a short essay for selected topics.

〔教科書〕

使用しない

〔参考書等〕

授業中に紹介する

〔授業外学修(予習・復習)等〕

Homework will be assigned in the class.

〔その他(授業外学習の指示・オフィスアワー等)〕

Office hour: Everyday later than 17:00 at Room N228

※オフィスアワーの詳細については、KULASIS で確認してください。