

# Overview

2023

## Faculty of Agriculture / Graduate School of Agriculture



### History

The Kagawa School of Agriculture, established in 1903, was one of the first agricultural training institutions in Japan. It was committed to developing and utilizing a scientific approach and the newest techniques to advance agriculture in Japan. Over the years the school grew and adapted to meet the changing demands of agriculture, the school was integrated with Kagawa University in 1955 as the Faculty of Agriculture. Since then, the Faculty of Agriculture has continued to grow and develop to meet accelerated changes in agriculture, many new technologies and exciting fields of study.

### Education

#### Faculty

The Faculty of Agriculture is organized into one unified department, the Department of Applied Biological Science.

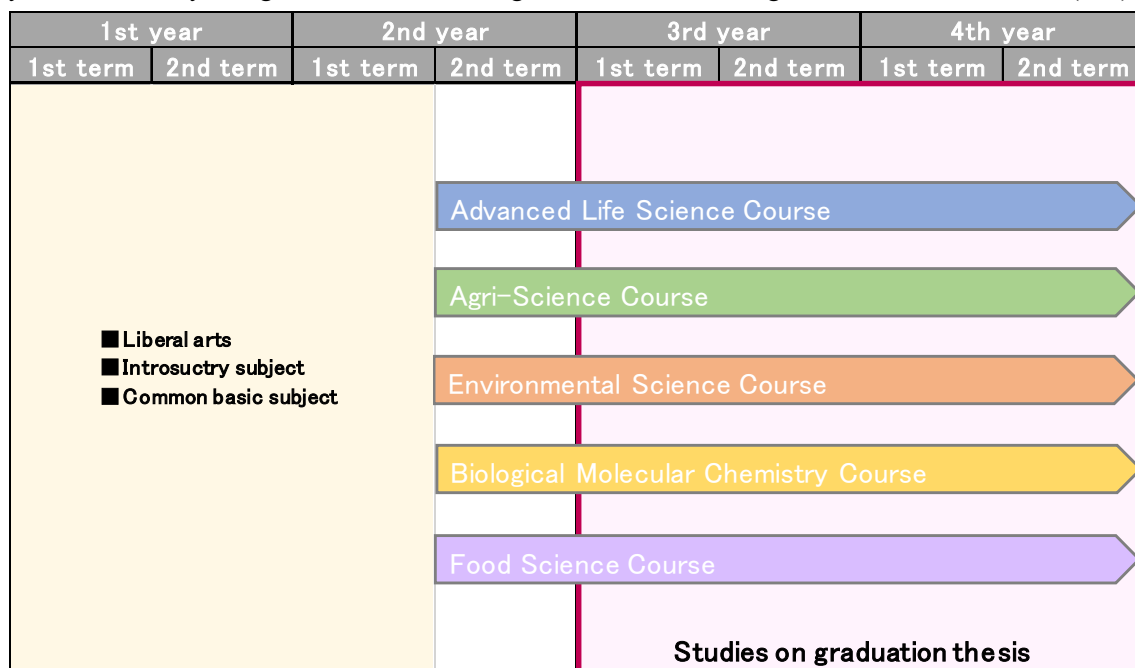
**Faculty members:** 57 (April, 2023)



## Undergraduate Studies

**Undergraduate Students:** 600 (150 new students per academic year)

Undergraduate education is conducted by the Department of Applied Biological Science in cooperation with the University Farm and the Marine Environment Research Station. The Faculty of Agriculture aims to foster individuals able to work actively in the fields of biological production and bioscience business. The academic year is basically divided into two terms. During the first year and the first term of the second year, students take introductory and common basic subjects required for study in this faculty, in addition to liberal arts which are commonly taught in all faculties. Studying basic knowledge and skills for the production and use of biological resources, students select one of five education courses (see below) for systematic studies of their majors in the second term of their second year. They focus their studies on their graduation thesis beginning in the **first** term of their third year. The Faculty of Agriculture offers undergraduate studies leading to a Bachelor of Science (Bsc).



### Credits required for graduation (minimum)

Liberal arts	32 credits
Introductory and common basic subjects	30 credits
Major subjects (graduation thesis)	62 credits (12 credits)
Total	124 credits

Lecture (2 credits): 2 hours x 15 times

Practical training / Experiment (1 credit): 30 or 45 hours

## Five education courses:

### 1) Advanced Life Science Course

The Advanced Life Science Course focuses on biological phenomena and the functions of a variety of life forms, from microorganisms to plants and higher animals. Remarkable progress in life science and biotechnology has made it possible to elucidate life phenomena, including the properties and functions of substances created



by organisms on the molecular level for sophisticated applications. Advanced life science covers a wide range of topics subjects. Life sciences investigate the activities of various life forms, from microorganisms to plants and higher animals at both the molecular and genetic levels. Fundamental biological research on the development of useful organisms and the efficient use of bioresources is applied utilizing the latest technology to investigate the development of useful organisms and the more efficient use of bioresources.

### 2) Agri-Science Course

The Agri-Science Course focuses on the principles and technology of bioresources production, post-harvest and environmental control, including economics. The Agri-Science Course aims to help ensure a safe and stable food supply for the development of affluent societies and the production and development of horticultural resources to ensure a sustainable lifestyle. It



provides a systematic and practical program of study covering the evaluation of genetic resources, selective breeding, production technologies & environment, and logistic & utilization systems for products, including both fieldwork and biotechnological training. This unique course allows students to learn basic and applied theories systematically and verify these theories through well-designed experiments and fieldwork at the University Farm.

### 3) Environmental Science Course

The Environmental Science Course focuses on essential knowledge and application of various chemical substances with biological functions, and on developing a solid foundation in the chemistry and biology of various ecosystems (from the terrestrial land to the seas). This course focuses on

interactions between organisms and the environment and material circulation in the environment. With particular emphasis on village forests and populated coastal areas, students work in fields, laboratories and on test farms to investigate and analyze using techniques and theories from various fields, such as chemistry and biology. This program allows them to acquire practical ability to work on the utilization, management, and conservation of the environment and life forms.



#### 4) Biological Molecular Chemistry Course

Organisms produce a wide variety of molecules (organic compounds) and use these molecules for communication with other organisms and self-defense. The Biological Molecular Chemistry Course focuses on understanding the survival strategy of organism in the natural world by the exploration, structural analysis, chemical synthesis and analysis of action mechanism of these molecules and aims at development of human resources who can offer useful molecules or the technique and information in conjunction with the molecules in the diverse fields such as agriculture, medicine and food.



#### 5) Food Science Course

Students understand and get knowledge of the various functions of foods and food ingredients for enhancing preference and maintaining human health. Therefore, you will study on the following three subjects. (1) Functionality of Food: It will be lectured chemically and nutritionally through the classes of “Food Chemistry”, “Food Protein Chemistry” and “Nutritional Biochemistry”. Super-aging society in Japan needs various information on functional foods. (2) Food Safety: it is main topic of “Food Hygiene”, “Food Microbiology”, and “Biodefense Science” classes, in



which students understand about the current issues of various risks from toxic chemicals and harmful microorganisms, and then know how to improve food safety. Knowledge on risk assessment and hazard prevention methods is essential to be understood. (3) Food Processing and Preference: these are mainly taught in the classes of “Food Physical Chemistry,” “Food Processing,” “Functional Properties in Food Products,” and “Applied Enzymology.” Through sensory tests, physical tests, etc., students learn how to make processed foods, giving highly functional nutrients and highly palatable sensation. This course program provides a wide range of curriculum in basic and practical subjects and experiments/practical training (including factories tours and visiting research institutes)

## Master’s Degree Programs (2 years)

The Graduate School of Agriculture is organized into one unified academic division, the Applied Biological Science and Rare Sugar Sciences.

**Graduate Students:** 120 (60 new students per academic year)

The Graduate School of Agriculture aims to foster advanced professionals who are actively involved in the international fields of biological production, bioscience business and bioscience research. Through academic research of international standards, students gain expert knowledge and skill regarding applied biological science and rare sugar science. Students select one of four education courses for systematic studies of their majors. The Graduate School of Agriculture offers graduate studies leading to a Master of Science (Msc).

### **Four education courses:**

#### **1) Advanced Rare Sugar Science Course**

Advanced Rare Sugar Science Course focuses on “rare sugars”, which is defined as monosaccharide and its derivatives that rarely exist in nature, with emphasis on development background, properties, functionality, and industrial applications. Based on historical background, students learn various possibilities of rare sugar application. This course aims to foster human resources who play an active part in the international field of rare sugar science.

#### **2) Environmental and Biological Science Course**

Environmental and Biological Science Course focuses on cultivation of advanced professionals who are required in the field of environmental and biological science industries. This course aims to foster human resources with practical ability to work on the utilization, management, and conservation of

the environment, as well as the development of sustainable system for bioresource production.

### **3) Biological Chemistry and Food Science Course**

Biological Chemistry and Food Science Course focuses on education of experts with extensive knowledge and experimental approach based on analytical chemistry, physical chemistry, organic chemistry, polymer chemistry, biological chemistry, and food science. This course aims to develop human resources with practical ability to work on advanced utilization of bioresource, biomass, rare sugars; development of high-performance materials for bioresource industry; and development of new food and food related products.

### **4) Applied Life Science Course**

Applied Life Science Course focuses on biological phenomena and the functions of a variety of life forms (from microorganisms to plants and higher animals) at both the molecular and genetic levels, as well as their practical application. This course aims to develop human resources with advanced expertise and skills for fundamental biological research including the properties and functions of various biomaterials and for leading the development of novel and useful bioresources.

## **Doctoral Degree Programs (3 years)**

The United Graduate School of Agricultural Science (UGAS) is a consortium built on the integrated Master's courses of Kagawa, Kochi, and Ehime Universities with the main office located at the Ehime University campus. Although UGAS draws from the facilities and staff of the master's course of each university, it is an independent institution that operates separately under its own management and regulations. This organization makes it possible to provide a higher and broader level of education and research than would be available at any of these universities alone. Three majors are offered by UGAS: Bioresource Production Science, Applied Bioresource Science and Life Environment Conservation Science. UGAS aims to produce top-class scientists who have a broad range of knowledge and a high level of specialization in the fields of bioresources and production and offers doctoral studies leading to a Doctor of Philosophy (PhD).

### **Three majors:**

#### **1) Bioresource Production Science Major**

In the Shikoku region, agricultural and livestock industries have developed by taking advantage of the complicated geographical features on Shikoku Island. The industries cover a wide range such as the

horticultural production of vegetables and ornamental plants in open fields as well as under structure; the production of citrus fruits; aquaculture fisheries in the inland sea and coastal areas; forestry; and animal husbandry. This course is intended to enhance the level of fundamental research and develop applied technology for the production and management of plant and animal resources.

**Fields of study**

- Plant Resource Production
- Plant and Animal Production under Structure
- Aquaculture and Livestock Production
- Bioresource Economics

**2) Applied Bioresource Science Major**

The processing and storage of agricultural produce, or more specifically its effective use, is a growing sector important for the national economy and is also a means of meeting diverse social needs for agricultural products. There is an increasing need for basic research and education in the development of new biochemical technology. This course is concerned with the field of study for understanding the utilization process of food from its production to ingestion and for application of knowledge about the use of economic resources from the viewpoint of chemistry, physics, physiology and biochemistry.

**Fields of study**

- Food Science
- Bioresource Science for Manufacturing

**3) Life Environment Conservation Science Major**

The increasing world population and consumption of natural resources has reached an unprecedented level. Conservation and efficient use of the environment, the base for bioresource production and human existence, are major issues for agriculture. This course provides education and research about the structure and function of various ecosystems ranging from the terrestrial land to the seas, along with environmental changes caused by the human activities, and conservation and management of life environments.

**Fields of study**

- Land Conservation and Irrigation Engineering
- Environmental Science

## Facilities

### Library

The Faculty of Agriculture Branch of the Kagawa University Library System is utilized by students, faculty, administrative staff, and researchers. On-site books and journals may be used in regular library hours, or borrowed by authorized users. Authorized users may access a wide variety of academic resources through online database systems using library computers.



### University Farm

The University Farm (about 17 hectare) is located about 6 km away from the Faculty of Agriculture. Students can experience practice agricultural activities such as crop farming, livestock feeding, and green-house culturing. The University Farm is also used for agricultural research. One notable success is the unique research activity to breed a new grape for wine. A Japanese wild grape was crossed with a high-quality edible grape of European origin ('Muscat of Alexandria'), and then a new line was selected from the progeny. The selected line is well adapted to the hot and humid climate of Kagawa area and is promising high-quality red wine production.



### Aji Marine Station

The Marine Environment Research Station is located in neighboring Aji-town, facing the Seto Inland Sea, about 20 km away from the Faculty of Agriculture Campus.

Research primarily focusses on eutrophication in the coastal water, especially red tide and fish-farm capacity. Kagawa University has been playing a leading role in research in this area. Currently, changes of phytoplankton biomass, ammonium



and phosphate fluxes and silicate exchange rates are being monitored to elucidate the dynamics of water movement in a shallow-water coastal ecosystem and their impact on fishery.

