College of Agriculture and Life Sciences

Contact Information
Phone: +82-62-530-2003
Fax: +82-62-530-2002
E-mail: y-choi@jnu.ac.kr
URL: http://agric.jnu.ac.kr

Plant Biotechnology

What is Plant Biotechnology?
Plant biotechnology deals with theories and techniques for plant production harmonized with nature and agro-ecosystems, which are the basis of life. It also pursues the exploration of life phenomena in crop plants at various levels from plant molecular to community through understanding heredity, environment, and their interrelationships, in order to ensure both the productivity and quality of crop plants. The goal of the Department is to promote global talents through teaching and training on (1) breeding novel crop varieties using traditional and molecular tools, (2) understanding the mechanisms of plant adaptation to abiotic and biotic stresses, (3) identifying, understanding, and producing new substances in industrial and medicinal plants having specific functions, (4) establishing sustainable agricultural systems by minimizing limiting factors to crop production, and (5) understanding crop responses to global environmental change (GEC) and strategies to cope with GEC.

Department of Plant Biotechnology
The Department of Plant Biotechnology offers majors in applied plant science, horticulture, biotechnology, and applied biology.

Professors

Applied Plant Science
- Han Yong Kim, Ph.D.
  [Rice Crop Science, hyk1020@jnu.ac.kr]
- Jonghan Ko, Ph.D.
  [Crop Environmental Ecology, jonghan.ko@jnu.ac.kr]
- Ok Ran Lee, Ph.D.
  [Special Crop Science, mrpizlee@jnu.ac.kr]
- Bo-Keum Ha, Ph.D.
  [Crop Genetics & Breeding, bkah@jnu.ac.kr]
- Jaeil Cho, Ph.D.
  [Climatological Crop Physiology, chojaeil@chonnam.ac.kr]

Horticulture and Biotechnology
- Wol-Seo Kim, Ph.D.
  [Pomology, wskim@jnu.ac.kr]
- Tae-Ho Han, Ph.D.
  [Floriculture, hanth@jnu.ac.kr]
- Jong-Hyun Lee, Ph.D.
  [Greenhouse, leetre@jnu.ac.kr]
- Sung-Gil Kim, Ph.D.
  [Horticultural Crop Breeding & Genetics, dromion@jnu.ac.kr]
- Sang Hyeon Lee, Ph.D.
  [Propagation of Horticultural Crops,
Applied Biology
- Hun-Seung Kang, Ph.D. [Biochemistry, kyang@jnu.ac.kr]
- Young-Cheol Kim, Ph.D. [Plant Pathology, yckimyc@jnu.ac.kr]
- Yeon-Soo Han, Ph.D. [Insect Pathology, hmys@jnu.ac.kr]
- Cheol-Soo Kim, Ph.D. [Plant Functional Genomics, cskim26@jnu.ac.kr]
- Kwang-Yeol Yang, Ph.D. [Molecular Plant Pathology, kyang@jnu.ac.kr]
- Ik-Soo Kim, Ph.D. [Insect Molecular Phylogenetics and Ecology, ikkim81@jnu.ac.kr]
- Yasuyuki Arakane, Ph.D. [Insect Chitin Biotechnology, yasuyukiarakane@jnu.ac.kr]
- Rae-Dong Jeong, Ph.D. [Plant Virology, jraed2@jnu.ac.kr]
- Min-Cheol Arakane, Ph.D. [Insect Phylogenetics, arakane@jnu.ac.kr]
- Yasuyuki Kiyokawa, Ph.D. [Molecular Plant Pathology, yasuyuki@jnu.ac.kr]

Degree Requirements
Students are required to earn 130 credits to graduate.

What Do You Study?

General Courses
General Biology 1 (3)
General Chemistry 1 (3)
Global Communication English (3)
Career Plan and Self Understanding (2)

Electives
General Botany (3)
Field Practice 1 (2)
Field Practice 2 (18)
Field Practice 3 (30)

Applied Plant Science Major Courses
Core Courses
Basic Lab of Crop Production (1)
Industrial Crop Science and Practice (3)
Plant Breeding and Experiment (3)
Food Crops 1 and Practice (3)
Food Crops 2 and Practice (3)

Electives
Principles of Crop Production (3)
Climatological Crop Physiology (3)
Plant Biochemistry (3)
Genetics (3)
Agricultural Meteorology (3)
Seed Science (3)
Soil and Production Environment (3)
Introduction Regional Agriculture (3)
Crop Ecology (3)
Environmental Vegetation Ecology (3)
Biosciences (3)
Environmental Vegetation Management (3)
Molecular Crop Breeding (3)
Crop Molecular Genetics (3)
Quality Assessment and Management (3)
Plants Environmental Control and Management (3)
Pragmatic management of climatic damage (3)
Crop Growth Modeling (3)
Farm Management (3)
Field Machinery and Practice (3)
Principles of Crop Protection (3)
Medicinal Plant Science (3)

Electives
Genetic Manipulation of Plants (1)
Insect Physiology (3)
Applied Entomology Lab (1)
Plant Pathology Lab (1)
Molecular Plant Pathology (3)
Molecular Vector Entomology (3)
Molecular Insect Pathology (3)
Insect Biotechnology (3)
Plant Molecular Biotechnology (3)
Insect Ecology (3)
Plant Virology (3)
Clinical Plant Pathology (3)
Plant Disease Management (3)
Plant Environmental Physiology (3)
Functional Insect Genomics (3)
Phytopharmacology (3)
Undergraduate Research in Plant Doctor (3)
Cell Biology (3)
General Microbiology (3)

Production of Functional Materials (3)
Environment Conservative Plant Production (3)
Climate-smart management of agroecosystem (3)
Management of Crop Post-harvest (3)
Plant Tissue Culture (3)
Understanding of Agricultural Science (3)
Capstone Design Practice (3)
Field Practice 1 (2)
Field Practice 1 (2)
Field Practice 3 (30)
Field Practice 2 (18)

Minor Courses
21 credits must be chosen.

Horticulture and Biotechnology Major Courses
Core Courses
Introduction of Floriculture (3)
Insect Pests of Plants (3)
Plant Pathology (3)
Introduction to Pomology (3)
Introduction to Vegetable Crops (3)

Electives
Genetic Manipulation of Plants (1)
Insect Physiology (3)
Applied Entomology Lab (1)
Plant Pathology Lab (1)
Molecular Plant Pathology (3)
Molecular Vector Entomology (3)
Molecular Insect Pathology (3)
Insect Biotechnology (3)
Plant Molecular Biotechnology (3)
Insect Ecology (3)
Plant Virology (3)
Clinical Plant Pathology (3)
Plant Disease Management (3)
Plant Environmental Physiology (3)
Functional Insect Genomics (3)
Phytopharmacology (3)
Undergraduate Research in Plant Doctor (3)
Cell Biology (3)
General Microbiology (3)

Plant Physiology 1 (3)
Biosciences (3)
Biochemistry 1 (3)
Biochemistry 2 (3)
Molecular Biology (3)
Genetics (3)
General Botany (3)
Principles of Plant Breeding (3)
Plant Tissue Culture (3)
Horticulture in Human Life (3)
Plant Propagation (3)
Horticulture Practice 1 (3)
Horticulture Practice 2 (3)
Floriculture (3)
Principles and Practice for Farming settlements 1 (3)
Principles and Practice for Farming settlements 2 (3)
Controlled Horticulture & Lab (3)
Plant Physiology 2 (3)
Introduction to Pomology (3)
Hydroponics (3)
Horticultural Plant Resources (3)
Vegetable Science and Technology (3)
Seed Science and Technology (3)
Post-harvest Physiology of Horticultural Crops (3)
Horticultural Therapy (3)
Organic Culture (3)
Proposal Construction for Farming Settlements (1)
Graduation Thesis Studio (3)
Insect Taxonomy (3)
Insect Control (3)
Plant Genetic Engineering (3)
Laboratory and Field Practice for Horticulture and Biotechnology 1 (3)
Laboratory and Field Practice for Horticulture and Biotechnology 2 (3)

Teaching Profession Courses
Biology Education (3)
A Research of Biology Teaching Materials & Teaching Method (3)
A Course on Biology Logic and Essay Writing (2)
Students become experts in agricultural industries. They find work as educators or researchers in government laboratories or private institutions. Other employment opportunities exist in seed and seedling companies, agro-chemical companies, agricultural cooperatives, and plant quarantine organizations. University positions such as assistantships in the areas of teaching and/or conducting are open to graduate students.
What is Forestry?

Forests occupy 65% of the land area in Korea. The mission of the Major in Forestry is to educate and engage the next generation of scholars, practitioners, and users of the forests, to conduct distinctive problem-solving and fundamental research on nature and use of forests and related resources, and to share discoveries and knowledge with others.

Major in Forestry

The Major in Forestry is dedicated to the understanding, effective management, and sustainable use of forests to support the national economy and public welfare, and to conserve the wider forest ecosystem.

Professors

- Ki-Wan An, Ph.D.  [Professor, Forest Policy, kihan@jnu.ac.kr, 062-530-2087]
- Young-Sang Ahn, Ph.D.  [Associate professor, Forest Environment Conservation Engineering, yasahn@jnu.ac.kr, 062-530-2081]
- Kye-Han Lee, Ph.D.  [Professor, Forest Ecology,]

Degree Requirements

Students are required to earn 130 credits with a minimum grade point average of 1.75 (out of a scale of 4.5).

Students must also enroll for 4 years and pass a comprehensive exam.

What Do You Study?

Core Courses
- Introduction to Forestry (2)
- Silviculture I and Practice (3)
- Dendrology (3)
- Dendrology Practice (2)

Electives
- Forest Management (3)
- Forest Protection (3)
- Seminar in Elementary Forestry (1)

Surveying and Practice (3)
- Principles and Practices for Farming Settlements 1 (3)
- Principles and Practices for Farming Settlements 2 (3)
- Economic Plants in Forests (3)
- Practice in Forest Entomology (1)
- Forest Entomology (3)
- Forest Measurement and Practice (3)
- Forest Recreation Resource Management (3)
- Forest Hydrology & Practice (3)
- Mushroom Cultivation and Practice (3)
- Forest Breeding and Tree Improvement (3)
- Field Trip to College Forest (Silviculture) (1)
- Silviculture 2 and Practice (3)
- Nature Interpretation and Practice (3)
- Forest Management Practice (2)
- Forest Ecology and Practice (3)
- Forest Soil Science (3)
- Range and Wildlife Management (3)
- Forest Machinery and Practice (3)
- Forest Civil Engineering and Practice (3)
- Engineering of Forest Environment Conservation and Practice (3)
- Forest Policy and Practice (3)

Proposal Construction for Farming Settlements (1)
- Forest Pathology (3)
- Urban Forestry (3)
- Forest Resources Capstone Design 1 (3)
- Forest Resources Capstone Design 2 (3)
- Forest Resources Field Practice 1 (2)
- Forest Resources Field Practice 2 (2)
- Practice in Forest Entomology (1)
- Tree Physiology (3)
- Forest CAD (3)
- Geographic Information System in Forests (3)
- Forest Laws and Practice (3)
- Forest Recreation Research Methods and Practice (3)
- Field Practice 2 (18)

Introduction to Wood Science and Engineering (2)

Teaching Profession Courses

- Theories of Agricultural Education (3)
- Research of Agriculture Teaching Materials and Teaching Method (3)
- Logic and Essay Writing in Agricultural Education (2)

Careers

Graduates may find work in the Korean Forestry Service, Korea National Arboretum, or National Plant Quarantine Service. They can also work in many other public organizations such as the Korea Highway Corporation, Korea National Park Service, the National Forestry Cooperatives Federation, and mushroom production companies.

Graduates who earn certificates in forest management or forest seeding may work in private nurseries and work as private forestry technicians.
Major in Wood Science and Engineering

After the UN Rio Environmental Summit in 1992, international interest in woody biomass-produced forests has grown due to their important roles in environmental conservation and bioenergy. The undergraduate program in Wood Science and Engineering is dedicated to extending wood resources to meet the growing needs of society through research on manufacturing and processing of wood-based materials which are indispensable to enhancing the quality of human life.

The program offers a wide variety of challenging career tracks: wood anatomy, wood physics, wood processing, wood improvement for design and construction of wood-framing structures, bioenergy, wood biotechnology, and wood chemistry. More specific wood chemical/biological processing programs also address the question of harnessing the environment for fiber and energy production in the near future.

Professors

• Woo-Yang Chung, Ph.D.  [Wood Furniture and Musical Instruments Engineering, wychung@jnu.ac.kr]
• Hyoung-Woo Lee, Ph.D. [Wood Processing and Machineries, hwlee@jnu.ac.kr]
• Jae-Won Lee, Ph.D. [Wood Chemistry, Bioenergy, ljw43376@jnu.ac.kr]
• Gi-Young Jeong, Ph.D [Wood Engineering, gjjeong1@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits, normally over a period of 8 semesters, in accordance with university regulations.

What Do You Study?

Core Courses

Introduction to Wood Science & Engineering (2)

Electives

Wood Anatomy & Lab. (2)

Wood Chemistry and Lab. (3)
Bioenergy (3)
Materials for Ecological Building Construction (3)
Plant Biopolymer (3)
Drying Technology in Forest Products Industry (3)
Unit Operations in Forest Products Industry (3)
Wood Improving and Lab. (3)
Climate Change and Living Environment (2)
Design of Wood Frame Construction & Buildings (3)
Logging Operations (3)
Instrumental Analysis of Lignocellulose (3)
Wood based composite analysis (3)
Plant and Wood Biotechnology (3)
Field experience in wood science area (3)
Forest Microbiology and Lab. (3)

Careers

Students may pursue various careers in wood- processing industries including lumbering, plywood, and furniture manufacturing and production.

Other industries include particle boards and fiber boards, pulp and paper, and the bio-fuel production industry.
What is Landscape Architecture?

Landscape architecture is the art and science of arranging the spaces and objects upon land for the benefits of natural environment and human society. It involves the analysis, planning, design, construction, management, and stewardship of the natural and built environments. It includes the systematic study of large land areas based upon the ecological concern and visual quality. It deals with the location of buildings and the organization of the spaces between them. Projects cover parks and recreation, resorts, campuses, gardens, green roofs, interior landscapes, streetscapes, public spaces, urban design, and restoration of streams and wetlands.

Department of Landscape Architecture

The Department of Landscape Architecture offers three degree programs; Bachelor, Master and Doctor of Philosophy in Landscape Architecture. It emphasizes the art and techniques of creating landscapes with a concern for ecology, natural resources, and social services. The faculty specializes in design, planning, construction, management, representation, technology, history and theory. Students will have skills to investigate characteristics of the site, identify solutions and its usage. Our programs guide students to have ability to restore disturbed landscapes, create sustainable ecosystems, and develop suitable and communities. They are introduced to the various scales of practice from small scaled spaces such as gardens, small parks, and green streets to large scaled ones such as communal parks, resorts, stream corridors, wetlands, cities, and regional watersheds. The program also includes visual and digital media based on programs such as computer aided design, Photoshop, and geographic information system.

Professors

- Hong-Mo Yang, Ph.D.  
  [Professor, Landscape/Environmental Planning, hmy@jnu.ac.kr]
- Tong-Baum Cho, Ph.D.  
  [Professor, Landscape Design, tobcho@jnu.ac.kr]
- Ji-Soung Baik, Ph.D.  
  [Professor, Landscape Planting Design, jsbaik@jnu.ac.kr]
- Eun-II Kim, Ph.D.  
  [Professor, Environmental Design, eikim@jnu.ac.kr]

Degree Requirements (Bachelor)

- Students are required to earn 130 credits, normally over a period of 8 semesters, in accordance with university regulations.

What Do You Study in undergraduate?

Core Courses

- Basic Landscape Design (3)
- Practice and Field Trip for Landscape Plants (3)

Electives

- Landscape Surveying and Practice (3)
- Principles of Landscape Planning (3)
- Perspective Techniques (3)
- Landscape Architectural Construction Materials (3)
- History and Field Trip of Landscape Architecture 1 (3)
- GIS and Environmental Planning (3)
- Computer-Aided Landscape Planning and Design (3)
- Landscape interior Practice (3)
- Computer Graphics in Landscape Architecture (3)
- Landscape Engineering and Practice (3)
- Landscape Planning Design and Practice (3)
- Park Planning and Design Studio (3)
- Environmental Open Space Design (3)
- Tourism and Recreation Planning (3)
- Site Planning and Practice (3)
- Landscape Design Media Studio (3)
- Landscape Maintenance (3)

Teaching Profession Courses

- Research of Educational Text and Teaching (3)
- Method of Plant Resources and Landscape Architecture (3)

Careers

Graduates may seek employment in the Ministry of Construction and Transportation, Ministry of Environment, Ministry of Government Administration and Home Affairs, local governments, Korea National Housing Corporation, Korea Land Corporation, Urban Development Corporation, Korea Highway Corporation, and private enterprises for landscape planning, design, construction, and management.
What is Biological Chemistry?

Biological chemistry covers the understanding and application of biology and chemistry to agricultural systems for the purpose of benefiting agricultural production.

The main objective of biological chemistry is to provide students with the combined knowledge of plant nutrition and physiology, biochemistry, molecular biology, natural chemistry, soil science, microbiology, and environmental pesticide science for pursuing studies and careers related to agricultural environment and life sciences.

Biological chemistry contains as its main subjects fertilizer science, plant nutritional science, biochemistry, physical chemistry, molecular biology, analytical chemistry, natural chemistry, organic chemistry, soil science, soil microbiology, pesticide science, general chemistry, biology, environmental chemistry, and their related laboratories and practical experiments.

Professors

- Jae-Han Shim, Ph.D.  
  [Professor, Natural Products Chemistry, jhshim@jnu.ac.kr]
- Kil-Yong Kim, Ph.D.  
  [Professor, Soil Microbiology, kjinc@jnu.ac.kr]
- In-Seon Kim, Ph.D.  
  [Professor, Environmental Pesticide Science, mndzer0@jnu.ac.kr]
- Hyang-Burn Lee, Ph.D.  
  [Professor, Environmental Microbiology, hblee@jnu.ac.kr]
- Woo-Jin Jung, Ph.D.  
  [Professor, Plant Resources Science, woojung@jnu.ac.kr]
- Jin-Chool Kim, Ph.D.  
  [Associate Professor, Plant Growth Regulators Science, kjinc@jnu.ac.kr]
- Yeon-Jong Koo, Ph.D.  
  [Assistant Professor, Biofertilizer, yeonjong@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits including 15 credits from core courses.

What Do You Study?

Core Courses

- Lab Work of Fundamental Chemistry (2)
- General Chemistry I (3)
- General Chemistry II (3)
- Lab Work of Life Chemistry (2)
- Lab Work of Applied Chemistry (2)
- Exercise in Agricultural Chemistry (3)

Electives

- Introduction to Biotechnology (3)
- Physical Chemistry (3)
- Quantitative Analysis (3)
- Principles and Practice for Farming Settlement 1 (3)
- Organic Chemistry 1 (3)
- General Microbiology (3)
- Introduction to environmentally-friendly agriculture (3)
- Environmental Ecology (3)
- Biochemistry 1 (3)
- Principles and Practice for Farming Settlement 2 (3)
- Organic Chemistry 2 (3)
- Eukaryotic Microorganism (3)
- Soil Science (3)

Careers

Graduates are able to find meaningful employment in agricultural companies related to pesticides and fertilizers, academic schools and institutes related to environmental and biological research, national institutes related to agricultural areas, industrial companies related to pharmaceutical areas, and national institutes related to analytical and toxicological areas.
What is Food Science and Technology?
Food Science and Technology emphasizes food technological issues related to human health and the food industry. The program trains students as food scientists or technologists armed with chemical, microbiological, biological fundamentals as well as engineering methodology for a comprehensive understanding of the physicochemical properties of food, processing and preservation of food materials and other biotechnological applications.

Professors

- Jong-Bang Eun, Ph.D.  
  [Professor, Food Processing and Preservation, jbeun@jnu.ac.kr]
- Jae-Hak Moon, Ph.D.  
  [Professor, Nutrition and Functional Chemistry, nutrmoon@jnu.ac.kr]
- Du-Woon Kim, Ph.D.  
  [Associate Professor, Food Microbiology and Food Biochemistry, dwkim@jnu.ac.kr]
- Young-Min Kim, Ph.D.  
  [Assistant Professor, Food Engineering and Enzyme Engineering, u9897854@jnu.ac.kr]

Degree Requirements
Students are required to earn 130 credits including 14 credits from core courses.

What Do You Study?

Core Courses
- Food Analysis and Lab 1 (2)
- Food Analysis and Lab 2 (1)
- Food Chemistry (3)
- Food Engineering (3)
- Nutrition Chemistry (3)
- Food Microbiology Lab (1)
- Food Precessing and Lab (1)

Electives
- Introduction to Agricultural Food & Biologocal Chemistry (3)
- Quantitative Analysis (3)
- Food and Health (3)
- Food Biochemistry 1 (3)
- Organic Chemistry 1 (3)
- Organic Chemistry 2 (3)
- Introduction to Processed Foods (3)
- Food Biochemistry 2 (3)
- General Microbiology (3)
- Natural Products Utilization (3)

Teaching Profession Courses
- Theories of Agricultural Education (3)
- Research of Agriculture Teaching Materials & Teaching Method (3)
- Logic and Essay Writing in Agricultural

Minor Courses
21 credits must be chosen.

Careers
Graduates of the Food Science and Technology Department become food scientists at food companies, the FDA, RDA, Agricultural Research & Extension Service, and the Research Institute related with Food and Biotechnology. They also become government officers related with hygienists, and processors (R&D, Quality Control, Production, Marketing).
What is Molecular Biotechnology?

A broad term of biotechnology is generally used to describe the use of biology in industrial processes such as agriculture, brewing, and drug development. The term also refers to the production of genetically modified organisms (GMOs) or the manufacture of products from genetically modified organisms. It involves the use of plants, animals, and microorganisms to create products or processes. Traditional applications include animal breeding, brewing beer with yeast, and cheese making with bacteria. Recent developments include the use of enzymes or bacteria in a wide range of applications, including waste management, industrial production, food production and remediation of contaminated land. Modern biotechnology, molecular biotechnology, also includes the use of gene technology, which allows us to move genetic material from one species to another. Biotechnology combines disciplines like genetics, molecular biology, biochemistry, embryology, and cell biology.

Major in Molecular Biotechnology

Molecular Biotechnology focuses on the study of regulation and function of genes at the levels of DNA, RNA, and protein in living organisms. Biotechnology aims to expand its usefulness by identifying and cloning new genes and traits, developing new diagnostic tests, and continuing to use these tools to better understand plants, animals, and microorganisms that make up the world.

Professors

- Oksoo Han, Ph.D. [Professor, Biochemistry, oshan@jnu.ac.kr]
- Kyungwhan Back, Ph.D. [Professor, Plant Genetic Engineering, kback@jnu.ac.kr]
- Soo Young Kim, Ph.D. [Professor, Molecular Cell Biology, sooykim@jnu.ac.kr]
- Jeoung-II Kim, Ph.D. [Professor, Protein Biochemistry, kimji@jnu.ac.kr]
- Hong Suk-Whan, Ph.D. [Professor, Molecular Genetics and Breeding, sukwhan@jnu.ac.kr]
- Lee Jun Ho, Ph.D. [Assistant Professor, Neuro Biotechnology, leejunho@jnu.ac.kr]
- Kim Don Kyu, Ph.D. [Assistant Professor, Molecular Endocrinology, dikkim2@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits including 12 credits from core courses.

What Do You Study?

Core Courses

- Molecular Biology
- Biochemistry
- Animal Genetic Engineering
- Plant Genetic Engineering

Electives

- Genetic Engineering and Human Life
- Organic Chemistry
- Molecular Biology
- Biochemistry
- Cell Biology
- Biostatistics
- Animal Physiology
- Analytical Chemistry
- Analytical Chemistry Lab
- General Microbiology
- Genetics
- Molecular Genetics
- Developmental Biology
- Molecular Cell Biology
- Plant Physiology
- Biotechnology Lab
- Molecular Breeding
- Crop Physiology
- Animal Cell Culture and Lab
- Immunology
- Virology
- Enzymology
- Recombinant DNA Lab
- Plant Tissue Culture
- Protein Engineering

Careers

Graduates of the Molecular Biotechnology Department obtain jobs at government research institutes (Korea Research Institute of Bioscience & Biotechnology, KIST, Korea Research Institute of Chemical Technology), National Research Institute, Rural Development Administration, Korea Food Research Institute, companies related to biotechnology, pharmaceutical companies, Bio-venture companies, and at the School of Dentistry/Medicine/Pharmacy, patent attorneys, government officials (Korea Food & Drug Administration, local extension workers, researchers), Graduate school, Studying abroad.
What is Animal Science?

The division of Animal Science (DAS) was founded in 1995 by merging the Department of Animal Science (founded in 1969) and the Department of Dairy Science (founded in 1973). Our division has made major contributions to research and supporting farmers in the meat, dairy, and feed industries.

Department of Animal Science

Our educational goals:

1) To provide high quality education and training for undergraduate and graduate students to serve internationally competitive and sustainable animal agriculture;

2) To provide new knowledge through basic and applied research in selected areas to improve efficiency in the production and quality of animal products.

The Department operates two research units (pet and special animals and small-to-large sized animals) and three information centers (119, SOS, and Sustainable Animal Research Center) to support research and teaching. This major offers various options so that students can select numerous areas to help them pursue a variety of employment opportunities.

Professors:

- Moon, Seung-Ju, Ph.D.
  [Animal Reproduction, sjmoon@chonnam.ac.kr]
- Kim, Kwang-Hyun, Ph.D.
  [Animal Production, ghkim@chonnam.ac.kr]
- Sun, Sang-Soo, Ph.D.
  [Animal Physiology, ssun@chonnam.ac.kr]
- Kim, Tae-Hwan, Ph.D.
  [Forage Physiology & Biochemistry, grasulp@chonnam.ac.kr]
- Kang, Man-Jong, Ph.D.
  [Transgenic Animals, mjkang@chonnam.ac.kr]
- Chin, Koo-Bok, Ph.D.
  [Meat Science, kbchin@chonnam.ac.kr]
- Oh, Se-Jong, Ph.D.
  [Animal Microbial Technology, soh@chonnam.ac.kr]
- Lee, Ji-Woong, Ph.D.

[Animal Breeding and Genetics, jwlee@jnu.ac.kr]
[Animal Metabolism, tjeon@jnu.ac.kr]
[Animal Metabolites, sunghakkim@jnu.ac.kr]

• Kim, Sung-hak, Ph.D.
  [Molecular biochemistry, sunghakkim@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits to graduate.

What Do You Study?

Livestock Farm Practice (1)
Animal Life Science (3)
Pet Animal Science (3)
Animal Cell Biology (3)
Animal Feeding & Lab (2)
Utilization of Animal Resources (3)
Animal Physiology & Lab (3)
Principles and Practices for Farming Settlements 1 (3)
Principles and Practices for Farming Settlements 2 (3)
Forage Production and Utilization & Lab (3)
Monogastric Animal Production (3)
Reproductive Physiology & Lab (3)
Gene Manipulation & Lab (3)
Animal Nutrition & Lab (3)
Germ Cell Biotechnology in Animals & Lab (3)
Animal Molecular Biochemistry Lab (3)
Meat Science & Lab (3)
Grassland Science (3)
The Ruminant Animal (3)
Dairy Food Processing (3)

Meat Processing and Lab (3)
Transgenic Animals & Lab (3)
Poultry Production & Lab (3)
Growth & Developmental Biology (3)
Animal Molecular Genetics (3)
Feed Science (3)
Proposal Construction for Farming Settlements (3)
Laboratory Animals (3)
Recycling of Animal Wastes (3)
Special Animals (3)
Animal Breeding (3)
Theories of Animal Science Education (3)
Studies of Animal Science Textbook and Teaching Methods (3)
Educational Theory of Animal Science Essay (2)
Introduction to Animal Resources Science (3)
Quantitative Animal Genetics (3)
Microbial Engineering & Lab (3)
Quality Control of Dairy Foods and Lab (3)
Animal Metabolism (3)
Stress and Immunity (3)
What is Rural and Biosystems Engineering?

Rural and Biosystems engineers apply integrated knowledge of physics, chemistry, biology, mathematics, engineering, and social science to rural and biosystems in order to contribute to the advancement of rural society, agricultural production and processing technologies, biological living systems, and environmental management policies. The Department of Rural and Biosystems Engineering graduates are very competitive in a wide variety of employment markets, not only in agricultural sectors, but also in non-agricultural areas. Recent graduates have found job positions in government agencies, state-invested firms, environmental consulting firms, construction companies, agricultural machinery companies, agricultural facility and plant companies, mechatronics companies, electronics companies, food and biomaterial processing companies, etc. Graduates contribute to meeting the needs of national and local society, such as developing agricultural machines, automating agricultural production systems, improving food quality and safety, improving rural amenities and environmental quality, and enhancing the quality of life for rural people.

Department of Rural and Biosystems Engineering

The Department of Rural and Biosystems Engineering pursues global competitiveness in agriculture and the sustainable development of rural communities through the application of integrated knowledge on engineering, natural science, and humanities and social sciences to agricultural and rural systems. The principal contents of research and education of the department are rural amenities, soil and water management, construction and management of infrastructure for rural systems, agricultural machinery, automation of agricultural production systems, precision and information agriculture, agricultural robotics, biomaterial processing, bionanotechnology, and food processing systems for biosystems majors. Through research and education, the Department serves industries and societies and achieves its reputation as a leader in the rural and biosystems engineering sector.

The Department develops graduates who can pursue engineering careers in industry, academia, consulting, or government. The curriculum is designed to educate the students to:

• possess engineering knowledge and skills on rural amenities and planning, environmental management, water resource conservation, soil remediation and management, and construction and management of rural infrastructure;

• possess engineering knowledge and skills on agricultural farm power and machinery, automation of agricultural production systems, precision and information agriculture, food and biomaterial processing, postharvest technology, and bio-robotics;

• be able to become successfully employed in engineering jobs in industry, government, or academia;

• produce graduates who continue to be engaged in professional development.

Students learn to apply fundamental knowledge of biological and physical sciences, mathematics, and engineering principles to formulate and solve engineering problems. Engineering design is integrated throughout the curriculum, along with opportunities to develop communication, learning, and teamwork skills, culminating in a capstone design experience. Electives in the curriculum allow students to specialize in:

- Rural Planning and Construction: Overall design, planning, and construction of rural systems for conservation and development of rural environments and communities.

- Environmental and Natural Resources Engineering: Development of water and soil resources management technologies for sustainable development of rural and agricultural systems.

- Agricultural Machinery Development and Automation: Development and automation of agricultural machines for crop planting, harvesting, and processing.

- Biological Engineering and Bionanotechnology: Development of innovative bio-platforms for improving life of living systems.

Students select courses with the assistance of faculty advisors on an individual basis. Faculty members also assist with professional development and job placement for students.

Professors

- **Rural System Engineering Major**
  - Kwang-Sik Yoon, Ph.D.  
    [Professor, Rural Environmental Water, ksyoon@jnu.ac.kr]
  - Woo-Jung Choi, Ph.D.  
    [Professor, Environmental Soil Science, wjchoi@jnu.ac.kr]
  - Won-Jin Baek, Ph.D.  
    [Professor, Rural Infrastructure Engineering, bwj215@jnu.ac.kr]
  - Seung-Hwan Yoo, Ph.D.  
    [Assistant Professor, Rural Water Resources Engineering, yooosh15@jnu.ac.kr]

- **Biosystems Engineering Major**
  - Soo-Nam Yoo, Ph.D.  
    [Professor, Farm Machinery, snyoo@jnu.ac.kr]
  - Young-Soo Choi, Ph.D.  
    [Professor, Biosystems Machine Control, y-choi@jnu.ac.kr]
  - Kyeong-Hwan Lee, Ph.D.  
    [Associate Professor, Sensors and Intelligent Biosystems, khlee@jnu.ac.kr]
  - Hyoung Il Son, Ph.D.  
    [Assistant Professor, Human-Centered Robotics and Automation, hison@jnu.ac.kr]
  - Jangho Kim, Ph.D.  
    [Assistant Professor, Nanengineered Biomaterial Systems, rain2000@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits, with 12 credits from core courses.

What Do You Study?

**Rural Systems Engineering Major Courses**

- **Core Courses**
  - Spatial Information Analysis (3)
  - Mechanics of Structures (3)
  - Irrigation & Drainage Engineering (3)
  - Agricultural Environment and Ecology (3)
Electives

CAD (3)
Engineering Mathematics (3)
Fluid Mechanics (3)
Applied Analytical Chemistry (3)
Applied Calculus (3)
Statics (3)
Surveying and Practice (3)
Rural System Seminar on Industrial Topics (3)
Construction Materials (3)
Hydraulics (3)
Applied Surveying and Practice (3)
Mechanics of Materials (3)
English for Rural Systems Engineer (3)
Environmental Soil Science (3)
Rural Environmental Engineering (3)
Soil Mechanics and Practice 1 (3)
Green Engineering Hydrology (3)
Environmental Pollution Analyses Lab (2)
Construction Methods and Equipment (3)
Rural Land Use Planning (3)
Onsite Water Treatment Engineering (3)

Biosystems Engineering Major Courses

Electives

Soil Mechanics and Practice ] (5)

Electives

Reinforced Concrete 1 (3)
Soil Mechanics and Practice 2 (3)
Foundation Engineering (3)
Statistical analysis of Climate-Smart Information (3)
Rural Planning (3)
Rural Tourism (3)
Rural Infrastructure Design (3)
Rural System Engineering Research Design (3)
Reinforced Concrete 2 (3)
Climate-Smart Disasters Prevention Engineering (3)
Farm Structures (3)
Rural Road Engineering (3)
Rural Settlement Planning (3)
Maintenance and Management of Structural Facilities (3)
Disaster Prevention Engineering (3)
Capstone Design for Rural System Engineers (3)
Land Remediation and Reclamation (3)
Field Practice for Rural System Engineer 1 (3)

Biosystems Mechatronics and Practice (3)
Bio-Industrial Machine Design 1 (3)
Bio-Resource Process Engineering and Practice (3)
Thermodynamics (3)
Mechanics of Structures (3)
Precision Agricultural Engineering (3)
Biosystems Automation (3)
Bio-Industrial Machine Design 2 (3)
Environmental Control in Greenhouses (3)
Fluid Machinery (3)
Computer Aided Engineering Design (3)
Biosystem Measurements and Practice (3)
Heat Transfer (3)

Computer Programming and Practice (3)
Tractor Engineering and Practice (3)
Nanobioengineering (3)
Biosystems Robotics (3)
Sensors for Bio-industry (3)
Hydraulics System Engineering (3)
Field Practice in Biosystems Engineering 1 (2)
Field Practice in Biosystems Engineering 2 (2)
Capstone Design of Biosystems I (3)
Capstone Design of Biosystems 2 (3)
Seminar on Industrial Topics 1 (1)
Seminar on Industrial Topics 2 (1)

Electives

CAD (3)
Engineering Mathematics (3)
Biology for Biosystems Engineering and Practice (3)
Fundamental Electronic Circuit for Biosystems (3)
Fluid Mechanics (3)
Applied Analytical Chemistry (3)
Applied Calculus (3)
Statics (3)

Biomechanics and Tissue Engineering (3)
Biosystems Modeling and Practice (3)
Environment Control in Biosystems Structures (3)

Manufacturing Process (3)
Dynamics (3)
Introduction of Biosystems Engineering (3)
Mechanics of Bio-Industrial Machine (3)
Electrical and Electronic Engineering and Practice for Biosystems (3)
Mechanics of Bio-Industrial Machine (3)
Mechanics of Materials for Biological Applications (3)

Careers

Graduates who obtain a broad engineering background through the Department’s program are sought after by a wide variety of employers. The following is a list of current employers:

Government Agencies

: Korea Rural Community Corporation
: Korea Water Resources Corporation
: Rural Research Institute
: Korea Electric Corporation
: Korea National Housing Corporation
: Korea Highway Corporation
: Korea Railroad
: Construction Companies
: Agricultural Machinery Manufacturers
: Agricultural Machinery Research Institute
: Korea Hydro and Nuclear Power Corporation
: Korea Gas Corporation
: Mechanical and Electrical Engineering-related Companies
: Food Production Companies
: Crop Storage and Handling Companies
: Agricultural Production Consultant Companies
: Korean Army and Police
What is Bioenergy Science and Technology?

Global demand for energy has tremendously increased due to the accelerated growth of the human population and the improvement of human life. Although natural gas and atomic energy have been utilized to supply a portion of the energy demand, petroleum resources will become depleted within this century. In addition, the increased consumption of fossil fuels will steadily increase emissions of carbon dioxide, augmenting greenhouse gases in the atmosphere. Thus, energy and the environment are inextricably linked. Reducing dependence on fossil fuels and imported oil is a challenge of vital importance to national security, the economy, and the environment. Bioenergy, based on biomass, has drawn attention as a sustainable energy source that may help cope with the rising prices of fossil fuels, and address environmental concerns about greenhouse gas emissions. Bioenergy science and technology are about basic biological and biochemical science on plant biomass and enabling technology, not only for the improvement of the yield and quality of cellulosic biofuels and biodiesels, but also for the production of biofuels.

Department of Bioenergy Science and Technology

The Department of Bioenergy Science and Technology was newly established in 2010 and selected as part of the World Class University (WCU) system by the Ministry of Education, Science and Technology. We will establish a pioneering education system for expanding learning opportunities from various academic backgrounds, such as plant biology, molecular biology, chemistry, biochemistry, biotechnology, biochemical engineering, and bioprocess engineering. This innovative education system is intended to accelerate basic research in the development of sustainable bioenergy, including cellulosic ethanol and other biofuels. The final aim of this new department is to provide experts with scientific and technological knowledge that will afford economic and social benefits to agriculture and the environment and, thus, improve the quality of life.

Professors

- Kim, Jungmook  
  [Professor, Plant Molecular Cell Biology, jungmkim@jnu.ac.kr]
- Suh, Mi Chung  
  [Professor, Plant Molecular Physiology, mcsuh@jnu.ac.kr]
- Ahn, Sangju  
  [Professor, Energy Crop Physiology, anschu@jnu.ac.kr]
- Bae, Hyeun-Jong  
  [Professor, Bioenergy & Biotechnology, baehj@jnu.ac.kr]

- Lee, Won-Heong  
  [Assistant Professor, Microbial Engineering, wonhlee@jnu.ac.kr]
- Oh, Eunkyoo  
  [Assistant Professor, Plant System Biology, eoh@jnu.ac.kr]

Degree Requirements

Students are required to earn 130 credits, normally over a period of 4 years (8 semesters).

What Do You Study?

- General Courses
  - General Biology 1 (3 credits)
  - General Mathematics (3)
  - General Chemistry 1 (3)
  - Career Plan and Self Understanding (2)
  - English for Global Communication (3)
  - General Chemistry 2 (3)
  - General Biology 2 (3)

- Core Courses
  - Biochemistry 1 (3)
  - Bioenergy (3)
  - Molecular Biology 1 (3)
  - Plant Physiology 1 (3)
  - Industrial Microbiology (3)
  - Bioinformatics (3)

- Electives
  - Introduction to Bioenergy Science and Technology (3)
  - General Plant Biology & Lab (3)
  - Campus Life and Career Roadmap (2)
  - Cell Biology 1 (3)
  - Organic Chemistry 1 (3)
  - Molecular Biology 2 (3)
  - Biochemistry 2 (3)
  - Physical Chemistry (3)

Careers

Bioenergy Science and Technology job opportunities include: biofuel or bioengineering or energy-related corporations, professors or researchers in plant biology, biology, or bioengineering, rural development administration staff, National Institute of Agricultural Biotechnology, Korea Research Institute of Bioscience and Biotechnology, agricultural research and extension services staff, Ministry of Agriculture and Forestry.
staff, National Plant Quarantine staff, Agricultural Cooperative Association staff, Agricultural Technology Center staff, the private sector (biotechnology and bioengineering or related) staff, and the Graduate School of Medicine and Dentistry.

What is Agricultural Economics?
The purpose of the Agricultural Economics (AE) major is to enable students to think like economists in solving problems related to the agricultural sector. Thinking like an economist involves using chains of deductive reasoning to help understand phenomena as well as problem-solving and creative skills in the agricultural sector.

Our goals are to increase understanding of economic behavior and improve students’ ability to understand and predict agricultural economic phenomena.

The main subjects of the Department of Agricultural Economics are agricultural economics, farm management, agricultural product price analysis, farm statistics, and resource and environmental economics.

Professors

- Jong-Seok Seo, Ph.D.
  [Professor, Mathematical Economics, jsseo@jnu.ac.kr]
- Suhk-Hyun Kim, Ph.D.
  [Professor, Resource and Environmental Economics, shane@jnu.ac.kr]
- Gue-Dae Cho, Ph.D.
  [Professor, Agricultural Policy, gcho6011@jnu.ac.kr]
- Hye-Jung Kang, Ph.D.
  [Professor, Farm Management, Production Economics, hjkang@jnu.ac.kr]
- In-Seck Kim, Ph.D.
  [Associate Professor, Agribusiness and Agricultural Marketing, i.kim@jnu.ac.kr]
- Yoon-Hyung Kim, Ph.D.
  [Assistant Professor, Environmental Economics, Dynamic Modeling, yonhk@jnu.ac.kr]

Degree Requirements
Students are required to earn 130 credits, normally over a period of 4 years (8 semesters).

What Do You Study?

Core Courses
- Agricultural Economics (3)
- Farm Management (3)
- Mathematics for Agricultural Economics (3)
- Agricultural Prices Theory (3)
- Agricultural Policy (3)
Resources and Environmental Economics (3)  
Electives  
Rural Sociology (3)  
Micro-analysis of Agricultural Economics (3)  
Agricultural Accounting (3)  
Regional Agricultural Economics (3)  
Statistics for Agricultural Economist (3)  
Agricultural Production Economics (3)  
Study of Korean Economy (3)  
Agricultural Extension Service (3)  
Korean Agricultural History (3)  
Agricultural Math Economics (3)  
Agricultural Project Appraisal (3)  
Agricultural Product Trade (3)  
Agricultural Econometrics (3)  
Agricultural Systems Analysis (3)  
Farm Finance (3)  
Rural Survey (3)  
Cooperatives (3)  
Farm Management Analysis (3)  
Agricultural Development (3)  
Practice in Economics (3)  
Agricultural Marketing (3)  
Agricultural Information (3)  
Macro-analysis of Agricultural Economics (3)  
Globalization and Food Security (3)  
■ Careers  
Possible careers extend to a multitude of organizations including the Rural Development Administration, Agricultural Research and Extension Services, government public institutions, research center, Agricultural Cooperative Association, Agricultural Technology Center, and other private sector firms.  
It is also possible to enter graduate school or study abroad.