

# AGRICULTURAL SCIENCES

## Departments and Schools

### Department of Agricultural and Biological Engineering

Founded in 1930, the Department of Agricultural and Biological Engineering in Penn State's Colleges of Agricultural Sciences and Engineering, provides high quality engineering education, research, and outreach. Our mission is to advance the engineering sciences, business, and technical management of biological and agricultural systems by promoting scholarship and engaging our students and stakeholders.

The Department of Agricultural and Biological Engineering offers two graduate programs: Agricultural and Biological Engineering and Bio Renewable Systems.

The Agricultural and Biological Engineering graduate program helps prepare students for careers involving the application of engineering principles to agricultural and biological production systems, processing systems, and conservation of land and water resources. The curriculum covers all areas of biological engineering, including development of machines for biological processing and agriculture, postharvest handling and processing of natural resource management and utilization, biological processes, food engineering, and structures and their environmental modifications.

The Bio Renewable Systems graduate program integrates science and technology with business (marketing, management, entrepreneurship, and leadership) for bio-based products/materials and their supply chains; provides an alternative high-quality graduate degree program for students without an engineering undergraduate degree; and prepares graduates to lead the development and advancement of the growing bio-based economy in key industry sectors: bio-based fuels, energy, chemicals, plastics, and packaging; pharmaceuticals; and cosmetics.

### Department of Agricultural Economics, Sociology, and Education

The scholarship in AESE is related to people, society, and economic systems grounded in theory and methods from the social, behavioral and economic sciences. We develop and employ approaches to discover fundamental and applied principles that advance science and improve the health, prosperity and welfare of people in Pennsylvania and beyond.

The Department of Agricultural Economics, Sociology, and Education has four graduate programs: Energy, Environmental, and Food Economics; Rural Sociology; Education, Development and Community Engagement; and Community and Economic Development

The Energy, Environmental, and Food Economics (EEFE) is a unique intercollege graduate degree program providing state-of-the-art training in economics and quantitative methods as applied to the energy economics, policy and systems, natural resources and the environment, and food industrial organization.

The Rural Sociology program provides students with the highest quality educational and research experiences in rural sociology. Graduates of the program have gone on to launch highly successful careers in academe, in government, and in non-governmental research organizations.

The Education, Development, and Community Engagement (EDCE) program develops the capacity of people to be positive agents of change in their communities through applied research and comprehensive

education, so that knowledge is translated into action. It prepares graduates for employment in college and university programs, non-formal education settings, state- and local-level administration, private industry, and international education.

The Community and Economic Development online program provides individuals with the knowledge and skills to work with citizens and leaders to establish and maintain viable communities and community organizations.

### Department of Animal Science

The Department of Dairy and Animal Science originated in 1887, when Henry Armsby became director of the Agricultural Experiment Station. Today the department encompasses all food production animals and companion animals. We offer world-class teaching, research, and extension programs in a variety of key areas in animal agriculture and the food system.

The Department of Animal Science has one graduate program that integrates all disciplines related to the function and care of animals with specializations in animal management, breeding and genomics, growth and development biology, meat science, nutrition, and nutritional, lactational and reproductive physiology.

### Department of Ecosystem Science and Management

The Department of Ecosystem Science and Management is Pennsylvania's leader in preparing students for careers in sustainable management of natural resources. We conduct research to create new knowledge about forests, wildlife and fisheries, soils, and watersheds, and disseminate that knowledge through the classroom and extension education programs serving various stakeholders. The Department of Ecosystem Science and Management offers three graduate programs: Forest Resources, Soil Science, and Wildlife and Fisheries Science.

The Forest Resources program focuses on research, education, and scientific technology in the fields of forest resource management, forest biology, environmental concerns, and forest products.

The Soil Science program provides opportunities for candidates interested in soil and related water resources to become a professional leader and an independent scholar.

The Wildlife and Fisheries program focuses on habitat evaluation, ecology and management of game and nongame wildlife, animal damage control, urban wildlife, wildlife responses to altered ecosystems, conservation biology, fish systematics, fisheries management, ichthyology, fish behavior and ecology, freshwater ecology, aquaculture, landscape ecology, terrestrial and wetland ecosystems.

### Department of Entomology

The diverse members of the Department of Entomology investigate fundamental and applied biological questions from the level of the molecule to population and community. The Department of Entomology offers one graduate program that is committed to conduct cutting-edge research in insect sciences with program themes like chemical ecology, ecological applications, disease biology and ecology, and pollinator biology and ecology.

### Department of Food Science

The Department of Food Science at Penn State is one of the premier food science departments in the country. Our undergraduate food science major offers students hands-on science dealing with real-world applications; small, friendly atmosphere; world-class internship

experiences; excellent scholarship opportunities, and near-100% job placement. The graduate program in the Department of Food Science delivers in-depth training in the core disciplines of food chemistry, food microbiology, food engineering and processing. There are also opportunities for students interested in nutrition education studies.

## **Department of Plant Pathology and Environmental Microbiology**

The Department of Plant Pathology and Environmental Microbiology provides students with top-ranked educational and research opportunities in a collegial and friendly atmosphere. A major goal of our department is to support growth of healthy plants to beautify our living spaces, sustain our food supply, and maintain an inhabitable ecosystem. The Plant Pathology graduate program encompasses many diverse and related sciences including microbiology, microbial ecology, plant disease epidemiology and management, molecular biology, genetics, and associated plant sciences.

## **Department of Plant Science**

The Department of Plant Sciences encompasses horticulture, agronomy and crops and soils sciences. Our mission is to enhance our understanding and management of agronomic and horticultural crops and managed landscapes that are the foundation for managed ecosystems, food and fiber production, landscapes and environmental quality to enhance human environments. The Department of Plant Sciences offers one residential graduate program, Agricultural and Environmental Plant Science and one online program, Turfgrass Management.

The Agricultural and Environmental Plant Science program emphasizes research that increases the efficiency of production of agronomic and horticultural crops, improves the quality of food, feed, and fiber available for humans and animals, develops an understanding of the basic soil-plant-animal climate complex, and improves the overall quality of the human environment.

In the Turfgrass online graduate program students learn business concepts, personnel management theories, and how to manage the day-to-day challenges of running a turfgrass facility through the Master of Professional Studies (MPS) in Turfgrass Management.

## **Department of Veterinary and Biomedical Sciences**

The Department of Veterinary and Biomedical Sciences at Penn State achieves excellence in research, teaching, and outreach in biomedical sciences and veterinary medicine. Our Department offers three undergraduate degrees at Penn State: Immunology and Infectious Disease, Toxicology, and Veterinary and Biomedical Sciences. The Department of Veterinary and Biomedical Sciences offers one graduate program in Pathobiology which seeks to understand the molecular basis of human and animal disease with a focus on immunology, microbiology, nutrition, biochemistry, virology, veterinary pathology, physiology, toxicology, and infectious disease.