

### » Course Overview

This course further delves into agriscience as a core global business. Students will explore fundamental business operations and structures as well as financial considerations. Students will understand the nutritional needs of livestock in order for them to be free from disease and be able to thrive in good health. Plants are heavily dependent on proper fertilization, irrigation, and nutrition to prosper. Thus, students will take a comprehensive look at the systems necessary to produce bountiful crops. The course will be rounded out learning about the tools and techniques needed to run an agriscience business and harvest crops.

### » Course Outline by Module

<b>Module 1</b>	The Agriscience Industry	<b>Module 5</b>	Plant and Crop Fertilization and Irrigation
<b>Module 2</b>	Agriculture Cooperatives and Agribusiness Finance	<b>Module 6</b>	Plant Pest Control
<b>Module 3</b>	Animal Health and Nutrition	<b>Module 7</b>	Maintenance of Facilities, Tools, and Equipment
<b>Module 4</b>	Plant Production Services	<b>Module 8</b>	Harvesting

### » Module Overview and Learning Objectives

#### | Module 1. The Agriscience Industry

Professional and trade organizations are groups of individuals or companies in a specific industry. These organizations can provide networking opportunities, training, and advocacy for their members. Within the agriscience sector, these organizations are vital. Additionally, it is critical that agriscience professionals learn about best practices and research within the industry by consulting professional industry journals. In addition to learning about organizations and professional journals, you will also investigate various types of businesses and how each type can fit into the agriscience industry.

**Learning Objectives:** In this module, students will:

- Identify and describe the importance of professional and trade organizations.
- Examine and interpret trade journals and academic research in the agriscience industry.
- Describe the five basic ways American business is organized.
- Identify and distinguish between the characteristics of each method of doing business.
- Evaluate the advantages and disadvantages provided by each business method.
- Evaluate how cooperative principles and practices differentiate cooperatives from other businesses.
  - Complete a job application

## **| Module 2. Agriculture Cooperatives and Agribusiness Finance**

Cooperatives are a type of business owned and operated by its members. There are various types of cooperatives, often depending on the type of industry and the needs of its members. The history of cooperatives dates back to the 1840s. Since that time, the cooperative model has grown and flourished. You will investigate the five main types of cooperatives and how each one is similar and different than the other types. In addition to cooperatives, you will learn about documentation regarding businesses such as contracts, deeds, and insurance policies. Finally, you will discover the requirements of State FFA Degrees and Proficiency Awards.

**Learning Objectives:** In this module, students will:

- Define a cooperative.
- Explain the history of cooperative principles and practices.
- Describe the five areas that classify cooperative structure.
- Identify and distinguish between the five types of cooperative structure and their functions.
- Explain the purposes and structures of contracts, leases, deeds, and insurance policies.
- Complete a State FFA Degree or Proficiency Applications.
- Identify the tax obligations of agricultural businesses. (ex. Property tax, intangible taxes, income taxes)

### | **Module 3. Animal Health and Nutrition**

Caring for animals and keeping them healthy has numerous advantages for any agriscience professional. In this module, you will explore some common diseases that farm animals may experience and how you can treat and prevent them. One of the ways to do that is through medication, so it's critical to understand what types of medications to use and how to read labels. A good way to keep animals healthy is by providing them an adequate and nutritious diet. When you are operating a farm or other agribusiness, you need to know how much you are spending on everything, including animal feed. Thus, it's essential to know how much animals require, what types of foods they consume, and their feeding rates.

**Learning Objectives:** In this module, students will:

- Recognize, describe and demonstrate prevention and treatment of common animal diseases, disorders, and pests.
- Read, interpret, and demonstrate correct uses of pesticides, medication, and other additives according to their labels.
- Formulate and compute least-cost feed rations.
- Select and apply growth stimulators and implants.
- Determine feeding rates and methods of feeding animals.

### | **Module 4. Plant Production Services**

Crops thrive when they're planted well. This means that they are planted at the right time and under the right conditions (weather and climate). An understanding of a community's agriculture is critical for any agriscience professional. You could be the utmost expert in every crop, but you're not going to get the crop to grow when the peak conditions are not there. Throughout this module, you'll explore things like understanding community varieties and making appropriate recommendations for crops in a particular region. It's also vital to know when to plant, how to space plants, what temperature they require, and at what rate the plants will grow. Grasping these concepts and using the right equipment to plant your crops will yield success!

**Learning Objectives:** In this module, students will:

- List the leading local (community) varieties of commonly grown crops for commercial production.
- Recommend varieties of local commercial plants and field crops.
- Identify the recommended planting rate, spacing requirements, and growth times for common garden crops.
- Describe the operation of and adjustment of plant production equipment

### **| Module 5. Plant and Crop Fertilization and Irrigation**

Plant and crop fertilization and irrigation are essential for maintaining and increasing crop yields. Fertilization provides plants with essential nutrients such as nitrogen, phosphorus, and potassium, which are necessary for proper growth and development. Irrigation, on the other hand, ensures that plants have enough water to survive and thrive. In this module, you will investigate specific fertilizer and irrigation systems and schedules to successfully manage crops. Without adequate irrigation, plants may become stressed and produce lower yields. Together, fertilization and irrigation play a crucial role in maintaining and improving crop production, which is essential for food security and economic development.

**Learning Objectives:** In this module, students will:

- Develop fertilization schedules and calculate fertilizer rates for plants.
- Identify common nutrient-deficiency symptoms in plants.
- Calibrate fertilization equipment and fertilize plants.
- Recognize soil and plant conditions indicating irrigation needs and develop an irrigation schedule.
- Compare and select irrigation equipment and methods.

### | **Module 6. Plant Pest Control**

Pests can wreak havoc on crops. If pests get in and are not treated, it can lead to a massive reduction in overall yield. Throughout the module, you will explore common plant pests and how they can damage plants. In addition, you will understand the lifecycles of these pests. You may wonder why this is necessary. Well, depending on the treatment you select, you may need to apply it at a certain phase of development in the lifecycle of the pest. Some treatments may be more effective if a pest is in the pupa phase rather than the adult phase, for example. Pesticides are used to treat these plants and eliminate pests. They can be chemical, cultural, or biological. You may even need a special license to use them. It's essential to read labels, interpret instructions, and understand how to do everything safely.

**Learning Objectives:** In this module, students will:

- Compare and contrast common plant pests and their damages.
- Diagram life cycles of insects, pests, and diseases.
- Interpret the procedures and requirements for obtaining a restricted-use-pesticide operator's license.
- Select, mix, and apply a no-restricted chemical according to the label and local, state, federal, and EPA regulations.
- Describe biological, chemical, and cultural methods of controlling plant pests.
- Develop Best Management Practices for pest management.

### | **Module 7. Maintenance of Facilities, Tools, and Equipment**

You are not a plumber and this is not a course in plumbing. However, it is highly advantageous to know how to maintain and repair irrigation systems so that you don't need to rely on a plumber to fix everything that might go wrong with various types of irrigation systems. If you own a farm or other agricultural operation, you need to protect the bottom line. The bottom line refers to the money your business makes or loses. You want to make sure that you continue to make enough money to keep your business operating successfully and, hopefully, profitable. Spending money on repairing and maintaining irrigation equipment is sometimes necessary, but learning as much as you can about doing it yourself will save you and your business a lot of money. Yes, you may

still need to call a professional when the repair is outside of what you know, but learning the basics can go a long way!

**Learning Objectives:** In this module, students will:

- Discuss basic facility maintenance, installation, or repair. (e.g., welding, electricity, plumbing, fencing, construction)
- Safely operate, maintain, service, and repair equipment.
- Install, operate, maintain, and repair irrigation equipment.
- Develop Best Management Practices (BMP) for water use.

### | **Module 8. Harvesting**

You've worked and worked and worked some more. Your plants have thrived. Your crops are ready. Now it's time to literally reap what you have sown. It's time to harvest. As you can imagine, there are a variety of ways to harvest your crops to sell them or get them ready for processing. There are many other elements to harvesting too - some that you may not have considered. For example, it's critical to look at market reports to find where your products will most likely be sold and in what form. You'll organize a way to market your products to retailers, food manufacturers, and food distributors so that they choose you over a competitor. While you're doing all of this, you will need to make sure your crops remain fresh and stored properly. Finally, it's time to pack up your products for sale or distribution. There are techniques and regulations for doing so. This module will review those processes and you'll be ready to get your harvest into the hands of consumers!

# Agriscience III

## Syllabus

**Learning Objectives:** In this module, students will:

- Describe procedures for harvesting products (produced by a marketing program).
- Collect and interpret market reports and identify market outlets for agricultural products (produced by program).
- Organize a marketing program for an agricultural product (produced by program or student).
- Assess kinds and types of storage facilities for agricultural products (produced by program).
- Grade, treat, pack, and/or store harvested products (produced by program).