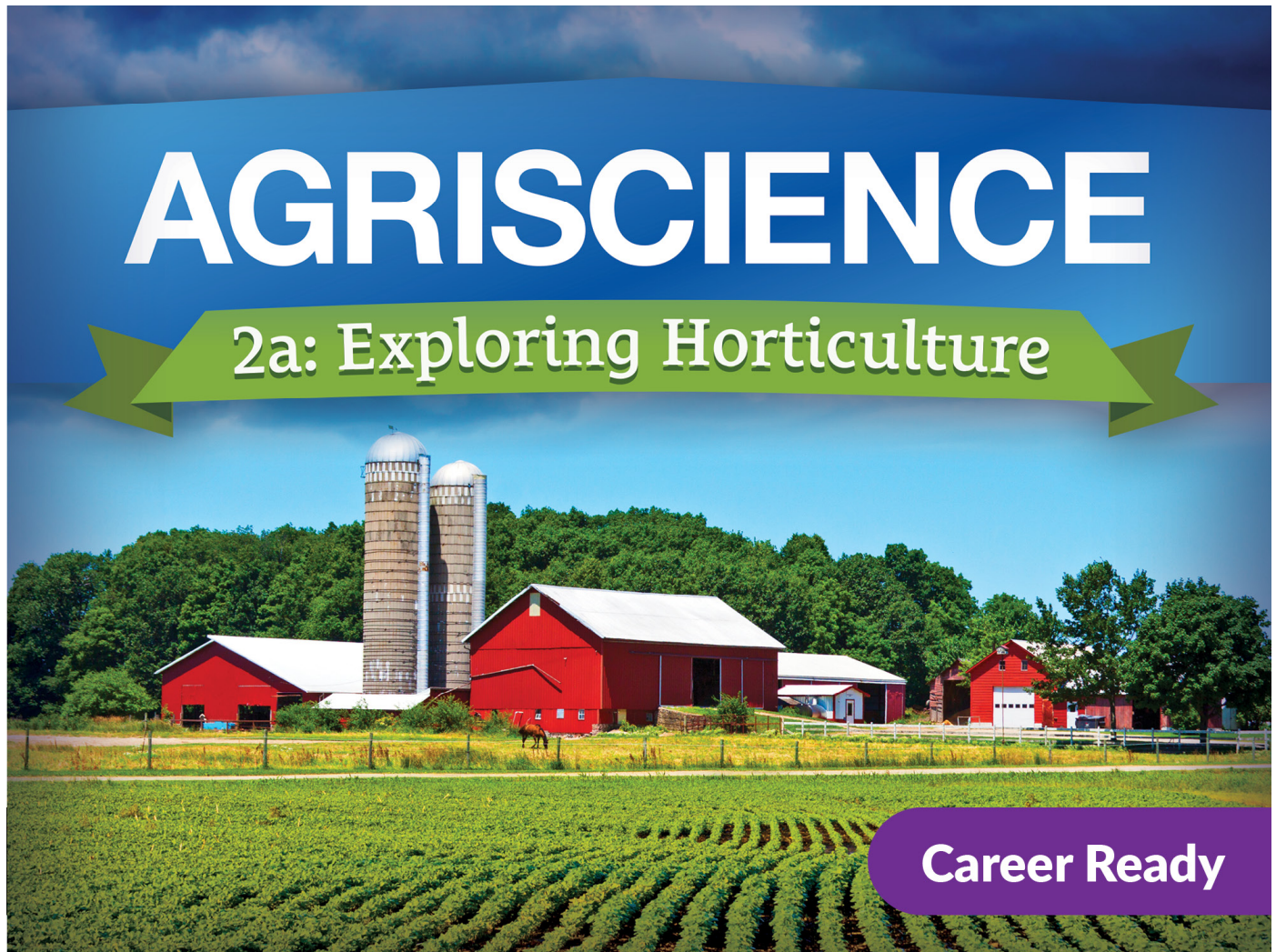


## Course Syllabus

What you will learn in this course



### **Agriscience 2a: Exploring Horticulture**

Get ready to dig deep beneath the water table to examine how plants and ecosystems impact the world of agriculture science. In this course, you will explore the uses and life cycle of plants as well as plant parts, genetics, functions, and processes. You will also develop an understanding of the horticulture industry, ethical impact and trends of the trade, and career opportunities in this fruitful field. Grab your gloves and prepare to leach some agriscience knowledge.

#### **Unit 1: Plants and Humans: A Delicate Balance**

Imagine a world with no plants. What kind of foods could we consume? Even if you think, “no plants, no problem because I’m a carnivore at heart,” don’t forget that even the animals we raise for our consumption rely on plants. Relationships between plants and animals help keep balance in individual ecosystems and in the world. Plants are also the foundation of an expansive agriculture industry, with economic and health impacts that are almost immeasurable. Let’s explore this balance and the many benefits we receive from plants.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the major characteristics of the relationships among plants and other organisms
2. Compare and contrast the domains of the horticulture industry
3. Investigate the role of plants in feeding the world
4. Discuss the role of plants as sources of fiber and fuel
5. Differentiate between the psychological and physiological benefits of plants

Unit 1 Assignments	
Assignment	Type
Lesson 01: Plants and Ecosystems	Lesson
Lesson 02: Domains of the Horticulture Industry	Lesson
Lesson 03: Plants as Food	Lesson
Lesson 04: Plants: Fiber and Fuel	Lesson
Lesson 05: Plants: Medicine and Aesthetics	Lesson
Critical Thinking Questions	Submission
Activity 1: What Do I Want to Learn from This Course?	Submission
Activity 2: Which Crops Power America?	Submission
Unit 1 Discussion 1	Discussion
Unit 1 Discussion 2	Discussion
Unit 1 Quiz	Multiple Choice

## Unit 2: The World of Horticulture

With an average annual salary of almost \$75,000 and the ability to work nearly anywhere worldwide, the horticulture industry offers strong career prospects for almost every interest. The economics of horticulture are impactful across the United States and the globe. There are limitless possibilities to start your own business or begin a career that encompasses areas such as conservation, plant production, food science, marketing, and much more! Let's take a look at the vast world of horticulture and opportunities to establish, grow, and thrive in a career in this industry.

## What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the impacts of the horticulture industry on the United States and global economies
2. Identify entrepreneurship opportunities in careers in horticulture
3. Compare and contrast careers in conservation, forestry, research, and education
4. Discuss the educational requirements, certifications, and opportunities for professional development in the horticulture industry

Unit 2 Assignments	
Assignment	Type
Lesson 01: Horticulture and the Economy	Lesson
Lesson 02: Entrepreneurship in Horticulture	Lesson
Lesson 03: Careers in Conservation and Education	Lesson
Lesson 04: Growing Your Expertise	Lesson
Critical Thinking Questions	Submission
Activity 1: Where Can I Go from Here?	Submission
Activity 2: What Is FNGLA?	Submission
Unit 2 Discussion 1	Discussion
Unit 2 Discussion 2	Discussion
Unit 2 Quiz	Multiple Choice

### Unit 3: Plant Anatomy and Physiology

Did you know that more than 2,000 types of plants are discovered each year? Although it may seem simple to know the basics of how plants function, once you understand that there are numerous varieties of plants and a wide array of differences between them, it can begin to feel quite overwhelming! In this unit, you'll learn the basics of plant parts and how you can tell some types of plants apart from others. From cells and leaves to flowers, plants are amazing and provide us with endless opportunities to benefit from having them in our homes, communities, and environments.

#### What will you learn in this unit?

After studying this unit, you will be able to:

1. Distinguish the major plant parts and their functions
2. Differentiate a complete flower from an incomplete flower
3. Compare and contrast monocot and dicot plants
4. Examine plant cells and their major parts

Unit 3 Assignments	
Assignment	Type
Lesson 01: Roots, Stems, and Leaves	Lesson
Lesson 02: Flowers, Fruits, and Seeds	Lesson
Lesson 03: Monocot Versus Dicot	Lesson
Lesson 04: Plant Cells	Lesson
Critical Thinking Questions	Submission
Activity 1: What Makes a Flower?	Submission
Activity 2: How Do Monocots and Dicots Differ?	Submission
Activity 3: What Parts Make Up a Cell?	Submission
Unit 3 Discussion 1	Discussion
Unit 3 Discussion 2	Discussion
Unit 3 Quiz	Multiple Choice

## Unit 4: Plant Nutrition and Processes

Have you ever felt like your diet and nutrition affected how you feel? If so, you share something in common with plants! Although it may never have occurred to you, you'll learn in this unit that plants and people have many similarities, including the fact that they require specific nutrition to function and maintain optimum health. Without the right balance of nutrients, plants cannot complete necessary life cycles such as growth and reproduction. We will also explore how different nutrients affect plants and the major mechanisms that help plants thrive. At the end, you'll have the opportunity to apply what you've learned. You might even walk away with skills that can help you keep your own houseplants healthy, happy, and thriving!

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Compare and contrast macronutrients and micronutrients
2. Differentiate signs and symptoms of nutritional deficiencies and disorders
3. Describe the process of photosynthesis
4. Analyze the processes of respiration and transpiration

Unit 4 Assignments	
Assignment	Type
Lesson 01: Essential Plant Nutrients	Lesson
Lesson 02: Nutritional Deficiencies	Lesson
Lesson 03: Photosynthesis and Nitrogen Fixation	Lesson
Lesson 04: Respiration and Transpiration	Lesson
Critical Thinking Questions	Submission
Activity 1: How Can I Experiment with Plant Nutrition?	Submission
Activity 2: How Can I Illustrate the Concepts of Respiration and Transpiration?	Submission
Unit 4 Discussion 1	Discussion
Unit 4 Discussion 2	Discussion
Unit 4 Quiz	Multiple Choice

## Midterm Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **first half** of the course (**Note:** You will be able to open this exam only one time.)

Midterm Exam Assignments	
Assignment	Type
Midterm Exam	Multiple Choice
Midterm Discussion	Discussion

## Unit 5: Plants and Water

The United States utilizes more than 346 billion gallons of fresh water each day, yet the amount of water that is on our planet has remained the same for two billion years. That's hard to imagine, isn't it? Water is essential to plant growth and life in general. In this unit, we explore the water needs of plants, water quality issues, types of irrigation, and principles that keep plants growing around our homes and communities.

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Evaluate the water needs of plants
2. Examine water quality issues and environmental conditions that are necessary for plant and animal life
3. Discuss the irrigation principles used in landscaping and nurseries
4. Differentiate between the basic irrigation systems used in landscaping and nurseries

Unit 5 Assignments	
Assignment	Type
Lesson 01: Water Needs of Plants	Lesson
Lesson 02: Water Quality and Chemistry	Lesson
Lesson 03: Irrigation Principles	Lesson
Lesson 04: Irrigation Systems	Lesson
Critical Thinking Questions	Submission
Activity 1: What Irrigation System Would I Recommend?	Submission
Activity 2: How Are Water Issues Diagnosed?	Submission
Unit 5 Discussion 1	Discussion
Unit 5 Discussion 2	Discussion
Unit 5 Quiz	Multiple Choice

## Unit 6: Plant Genetics and Genomics

Plant reproduction or propagation is the process by which the number of a species is increased. You may know that plants cross-pollinate, but did you know they can also self-pollinate? There are two types of plant propagation: sexual and asexual. Both processes are unique and have their advantages and disadvantages. The genetics of plants is amazing and constantly being studied to make crops and plants that are more productive and that have greater resilience. Let's explore the amazing world of plant genetics!

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Analyze plant sexual reproduction
2. Describe methods of asexual plant propagation
3. Explain the process of mitosis and meiosis in plants
4. Investigate the roles of DNA, heritability, and genetic applications in plant breeding

Unit 6 Assignments	
Assignment	Type
Lesson 01: Plant Sexual Reproduction	Lesson
Lesson 02: Asexual Plant Propagation	Lesson
Lesson 03: Plant Growth: Mitosis and Meiosis	Lesson
Lesson 04: The Roles of Genetics and Genomics in Plant Breeding	Lesson
Critical Thinking Questions	Submission
Cumulative Project 1: How Can I Propagate a Plant Using Cuttings?	Submission
Activity : What Is a Plant's Life Cycle?	Submission
Unit 6 Discussion 1	Discussion
Unit 6 Discussion 2	Discussion
Unit 6 Quiz	Multiple Choice

## Unit 7: Plant Biotechnology

The field of biotechnology spans many areas and industries. In agriculture, the term “green biotech” refers to the agriculture industry and the work being conducted by researchers and scientists to develop crops that are more sustainable and that can be improved through the use of genetic engineering. There are many types of plant biotechnology that are being developed to help farmers and plant producers improve the quality of their crops and plant material. The prospects for innovation and growth in the field appear limitless and are filled with exciting opportunities. However, there are challenges in this growing area of agriculture that bring about questions related to ethics and legality, as well as impacts on the economy that must be carefully considered.

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Explore historical achievements related to plant biotechnology and its development
2. Differentiate between the different types of plant biotechnology being used in the agriculture industry
3. Compare the variety of organizations that play roles in the management of plant biotechnology
4. Assess some of the economic challenges and benefits related to plant biotechnology

Unit 7 Assignments	
Assignment	Type
Lesson 01: History of Plant Biotechnology	Lesson
Lesson 02: Types of Plant Biotechnology	Lesson
Lesson 03: Ethical and Legal Issues	Lesson
Lesson 04: Economic Issues	Lesson
Critical Thinking Questions	Submission
Activity 1: How Do I Feel About Agricultural Biotechnologies?	Submission
Activity 2: How Can I Extract DNA?	Submission
Unit 7 Discussion 1	Discussion
Unit 7 Discussion 2	Discussion
Unit 7 Quiz	Multiple Choice

## Unit 8: Trends in Horticulture

Horticulture is an area of agriculture that many can enjoy, whether there is a large outdoor space ready for planting or just a small area on a shelf or countertop available in the home. Consumers are increasingly interested in enjoying the benefits of having fresh vegetables and herbs at their fingertips. Many people are jumping on board the growing trend of using houseplants to enhance the aesthetics of their homes. Other areas in the industry experiencing tremendous growth are precision agriculture and technology. Advances made in these arenas are helping growers and scientists find innovative ways to grow more with less space. Let’s check out some of the major trends in horticulture!

### What will you learn in this unit?

After studying this unit, you will be able to:

1. Describe the benefits and challenges of growing indoor edible gardens
2. Summarize current trends related to the increased demand for houseplants
3. Explore the origin of precision agriculture and the ways in which it is expanding as a result of technology
4. Explain some of the latest trends in precision agriculture, including artificial intelligence and unmanned aerial vehicles (UAVs)

Unit 8 Assignments	
Assignment	Type
Lesson 01: Indoor Edible Gardening	Lesson
Lesson 02: Houseplants	Lesson
Lesson 03: Precision Agriculture	Lesson
Lesson 04: Technology Trends in Agriculture	Lesson
Critical Thinking Questions	Submission
Activity 1: What Inspires Me?	Submission
Final Cumulative Project: How Do I Track the Growth of My Cutting?	Submission
Activity 2: What Did I Get from This Course?	Submission
Unit 8 Discussion 1	Discussion
Unit 8 Discussion 2	Discussion
Unit 8 Quiz	Multiple Choice

## Final Exam

1. Review information acquired and mastered from this course up to this point.
2. Take a course exam based on material from the **second half** of the course (**Note:** You will be able to open this exam only one time.)

Final Exam Assignments	
Assignment	Type
Final Exam	Multiple Choice
Final Discussion	Discussion