



Course Name: Plant Science (AGR1313)

Course Description: Scientific principles as the basis for practice in producing, handling, processing, marketing and utilizing agronomic and horticultural crops. Two lecture hours. Two lab hours. Three semester hours credit.

Instructor Information: Select the link for your instructor's name and contact information on the course home page.

Student Learning Outcomes:

Student Learning Outcomes (SLOs) are the specified knowledge, skills, or abilities that students are expected to attain by the end of this course.

Module 1 Chapters 1 and 14 – Plant Science Intro & Soil, Water, and Fertility Management

1. Discuss the role that plant science has played and continues to play in the world economy and culture.
2. Explain why modern plant scientists take into consideration production efficiency, economic viability, environmental compatibility, and social responsibility when researching the solution to a problem.
3. Describe the importance and principles of research in plant science.
4. Explain why and how land is prepared for growing plants.
5. Describe how improper soil handling degrades soil and how improper handling improves the soil.
6. Explain the practices that improve degraded soil and prevent degradation and conserve soil.
7. Discuss the basic principles and components of irrigation and drainage.
8. Describe how plant nutrition is managed through fertility practices.

Module 2 Chapters 2 and 15 – Terrestrial Ecosystems & Integrated Management of Pests

1. Describe the fundamental importance and relationship of plants and other organisms in terrestrial ecosystems.
2. Describe the different biomes of the world, how they are created, and how they determine what plants grow there.
3. Explain the relationship between natural ecosystems and the ecosystems we create when we grow plants.
4. Explain what influences photosynthetic productivity in natural and cultivated ecosystems.
5. Discuss the impact that cultivating plants have on ecosystems.
6. Explain the foundational concepts of weed science, entomology, and plant pathology.
7. Discuss five major strategies for managing weeds, insects, and diseases and how they can be combined to develop an integrated plant health management (IPHM) program.

Module 3 Chapters 3 and 16 – Plants for Human Use & Considerations for Products, Harvest, Postharvest Handling and Marketing

1. Discuss why plants must be cultivated for human use.
2. Describe the many ways plants are needed and used by humans.
3. Describe how growing plants impact our energy use and carbon footprint.
4. Discuss the factors to consider when doing a site analysis of the area where plants will be grown.
5. Explain the differences between traditional, organic, and sustainable production practices.
6. Describe how environmental factor management applies to growing plants.
7. Discuss the basic principles of harvesting.
8. Describe how quality changes after harvest.
9. Identify strategies to maintain quality after harvest.
10. Explain how the production of crops is linked with consumption through marketing and transport.

Module 4 Chapters 4 and 17 – Climate and Agronomic Crops

1. Describe the factors that create the climate.
2. Explain the interaction between climatic variables and how they vary from location to location.
3. Describe how climate factors influence plant growth and determine what plants can grow in an area.
4. Discuss what can be done to modify climate factors to improve crop growth.
5. Discuss the cultural practices common to nearly all field crops and the reasons behind those practices.
6. List the major field crops grown for food, fiber, fuel, and other industrial uses.
7. Describe the specific cultural practices used for growing many of those crops.

Module 5 Chapters 5 and 18 – Soils and Forage Crops

1. Discuss the concept that soil ecology is a complex system made up of many living and nonliving components.
2. Describe the components that make up a soil ecosystem and how they interact.
3. Describe the factors that influence soil formation and give soil its physical and chemical characteristics.
4. Describe the different types of forage and rangeland crops.
5. Explain the principles of hay and silage growing, harvesting, and storage.
6. Discuss rangeland ecology and the principles of rangeland management.
7. Describe the diverse uses of rangelands.

Module 6 Chapters 6 and 19 – Structure of Higher Plants and Vegetable Crops

1. Define the terminology that describes plant cells, tissues, and organs.
2. Explain the basic functions of plant cells, tissues, and organs.
3. Explain how some of the practices we use to grow plants are directed at specific tissues and organs.
4. Explain how vegetable production benefits society.
5. Discuss the differences between field, tunnel, and greenhouse vegetable production.
6. List the basic steps to successful vegetable production.
7. Describe the basic characteristics of the major vegetable crops.

Mid-Term Exam

- Will encompass Modules 1-6 and provide an opportunity for the student to display the knowledge gained from the first half of the course.

Module 7 Chapters 7 and 20 – Stages of Growth & Development and Temperate Fruit Crops

1. Know the difference between plant growth and plant development and understand ways to measure each.
2. Understand the factors that affect plant growth and development and what the effects are.
3. Understand how those factors can be manipulated to control plant growth and development.
4. Recognize the categories of plant hormones, understand their role in plant growth and development, and how they are used to control plant growth and development.

Module 8 Chapters 8 and 21 – Plant Chemistry & Tropical and Subtropical Fruits and Nuts

1. List the major biochemicals found in plants.
2. Explain how some of those chemicals are formed and some of their uses.
3. Describe how relatively few elements (carbon, hydrogen, oxygen, nitrogen, phosphorus, sulfur) are combined in nearly innumerable ways to create the structures or perform the functions required for plant growth and development.
4. Discuss the principal components of the tropical environment that differ from those of temperate environments, and how they influence the manner in which crop production is undertaken in the tropics and subtropics.
5. Explain the rationale for the adoption of diverse techniques and the manner in which these techniques are employed by small-landholder farmers to optimize crop production systems in diverse tropical environments.
6. Identify leading tropical fruit and nut species produced on both a large scale for export as well as in small settings near the home.

Module 9 Chapters 9 and 22 – Genetics & Nursery Production

1. Explain how the basic concepts of genetics relate to the production and utilization of plants.
2. Describe the common methods of plant breeding and sexual and asexual propagation.
3. Discuss how genetic engineering is used to introduce genetic traits into plants from unrelated or distantly related organisms.
4. List the factors that go into the site and product selection for a nursery.
5. Explain the principles of field and container (including pot-in-pot) nursery crop production.
6. Discuss the importance of and the methods for testing media fertility for container production.

Module 10 Chapters 10 and 23 – Cultivated Plants and Floriculture

1. Explain how plants are named and classified.
2. Use the nomenclature and system of taxonomic classification to identify plants and their relationship to each other.
3. Explain how several crops originated and where they were domesticated.
4. Discuss the importance of saving germplasm from extinction and the global system created to preserve germplasm.
5. Describe the basic greenhouse structure and components.

6. Explain how the greenhouse environment is manipulated to regulate plant growth and development.
7. Discuss the principles of growing several greenhouse crops.

Module 11 Chapters 11 and 24 – Photosynthesis and Turfgrasses

1. Explain the importance of the carbon cycle to life on Earth.
2. Describe the process of photosynthesis and how radiant energy is converted to chemical energy.
3. Explain the process of respiration and how it releases the chemical energy from photosynthesis.
4. Discuss how the carbon cycle relates to practices used in growing plants.
5. Define the terms commonly used in turfgrass science.
6. Explain the principles of establishing and maintaining turfgrasses.
7. Describe the different types of turfgrass and the environmental and cultural requirements of each type.

Module 12 Chapters 12 and 25 – Water Relations and Landscape Plants

1. Describe the forces that move and hold water in the soil.
2. Describe the forces that move water from the soil into and through the plant and into the air.
3. Explain the function of water in plants.
4. List the environmental characteristics that affect the growth of trees, shrubs, and herbaceous plants.
5. Describe how to choose and care for trees, shrubs, and herbaceous plants.
6. Discuss the proper planting of trees, shrubs, and herbaceous plants.
7. Explain the proper maintenance of trees, shrubs, and herbaceous plants.
8. List the names and characteristics of some of the common landscape plants.

Final Exam

1. Will encompass Modules 7-12 and provide an opportunity for the student to display the knowledge gained from the second half of the course.

Instructional Techniques: Weekly module assignments of textbook reading, watching, and listening to online video, and discussion of material from assignments.

Textbook Information: This course uses an ebook, which can be accessed through Course eBook tab on the left menu.

McMahon, M and Anton Kofranek and Vincent Rubatzky. 2020. Plant Science. (Sixth Edition). Pearson Education Inc, Hoboken, N.J. ISBN: 9780135184820.

Grading Information:

Module Lecture Quizzes

Each week you will be required to complete a module lecture quiz on the material covered that week. Each lecture quiz is worth a total of 50 points. The lecture quiz questions will be True or False, Matching, or Short Answer. Links to access each quiz can be found at the bottom of each module overview.

Module Lab Quizzes

Each week you will be required to complete a module lab quiz on the material covered in that week. These lab quizzes will contain a differing number of questions, but each of these quizzes will be worth 25 points. The lab quiz questions will be True or False, Matching, or Short Answer. Links to access each quiz can be found at the bottom of each module overview.

Writing Assignments

Each week you will be required to complete a module writing assignment. These assignments will be 1 or 2 open-ended questions relevant to the material covered that week. Each of these writing assignments is worth 10 points. Links to access each writing assignment can be found at the bottom of each module overview.

Assignment Weights

Assignments	Percentage of Total Grade
Module Writing Assignments (12)	6%
Module Lecture Quizzes (12)	30%
Module Lab Quizzes (12)	15%
Proctored Mid-Term Exam (1)	25%
Final Exam (1)	25%
Total	100%

Grading Scale

Grade	Numerical Grade
A	90-100
B	80-89
C	70-79
D	60-69
F	0-59
I	Incomplete Grade Status Only with approved documentation, all incomplete status requests must be approved by the Dean

Student and Instructor Responsibilities

You have the right to expect that your instructor will:

- Provide a comprehensive syllabus and course calendar.
- Display all due dates for readings, tests, and papers.
- Grade or otherwise respond to all tests and papers within a week of the due date.
- Inform you of your current grade and relative class standing upon request.
- Respond to any email, answer all appropriate questions, and behave in a professional manner, respecting you as an individual.

As a student, you have the responsibility to:

- Behave to all others in the class in a professional manner, being especially careful in email and other electronic communications to avoid personal attacks, harsh criticisms, and objectionable language.
- Pay attention to the course calendar and prepare for proctored midterm and final exams.
- Keep up with the course work.
- Submit all work by the due date.
- Support your classmates to establish a genuine learning community.

Course Calendar and Due Dates

All course due dates are posted in the Course Calendar. Always use the Course Calendar, and do not rely on the Canvas app calendar or To Do List.

Proctored Exams

eLearning courses at ICC require onsite proctored testing, which means students must complete designated assignments in a secured, observable, proctored environment. ICC provides testing labs free-of-charge at ICC's Fulton and Tupelo campuses, as well as partner institutions across the state. Please make plans for your exams early to ensure you can complete exams prior to deadline. Any requests to test out of state or using a virtual proctoring system must be requested and approved by the Dean of eLearning at least one week prior to exams starting. It is the student's responsibility to know testing dates and make arrangements to test prior to deadline. More information about proctored testing, as well as approved accommodations for out-of-state students and students with documented medical emergencies, may be reviewed by selecting the Proctored Testing link.

Make-up Policy

Online classes are very flexible and allow students to complete assignments at any time of the day, and from most locations. Assignments are made available for a time frame that should allow for completion. Missed assignments count as an absence and result in a grade of zero. Make-up work should only be necessary for extenuating circumstances and is at the discretion of the instructor. If work is missed, please contact your instructor immediately.

Technology Requirements

For best performance, Canvas should be used on the current major release of Chrome or Firefox. Computer operating systems should be kept up to date with the latest recommended security updates and upgrades. It is recommended to use a computer five years old or newer with at least 1GB of RAM. It is recommended to have a minimum Internet speed of 512kbps.