



ILLINOIS VALLEY COMMUNITY COLLEGE

COURSE OUTLINE

DIVISION: Natural Sciences and Business

COURSE: AGR 1226 Greenhouse Management

Date: Spring 2021

Credit Hours: 2

Prerequisite(s): None

Delivery Method: **Lecture** **2 Contact Hours** (1 contact = 1 credit hour)
 Seminar **0 Contact Hours** (1 contact = 1 credit hour)
 Lab **0 Contact Hours** (2-3 contact = 1 credit hour)
 Clinical **0 Contact Hours** (3 contact = 1 credit hour)
 Online
 Blended

Offered: **Fall** **Spring** **Summer**

IAI Equivalent –**Only for Transfer Courses**-go to <http://www.itransfer.org>:

CATALOG DESCRIPTION:

This course will cover topics related to greenhouse structures and their operation. Included topics are design, construction, location, heating and cooling systems, cultural practices and cost accounting as they are related to greenhouse management.

GENERAL EDUCATION GOALS ADDRESSED

[See last page for Course Competency/Assessment Methods Matrix.]

Upon completion of the course, the student will be able:

[Choose up to three goals that will be formally assessed in this course.]

- To apply analytical and problem solving skills to personal, social, and professional issues and situations.
- To communicate successfully, both orally and in writing, to a variety of audiences.
- To construct a critical awareness of and appreciation for diversity.
- To understand and use technology effectively and to understand its impact on the individual and society.
- To develop interpersonal capacity.
- To recognize what it means to act ethically and responsibly as an individual and as a member of society.
- To recognize what it means to develop and maintain a healthy lifestyle in terms of mind, body, and spirit.
- To connect learning to life.

EXPECTED LEARNING OUTCOMES AND RELATED COMPETENCIES:

[Outcomes related to course specific goals. See last page for more information.]

Upon completion of the course, the student will be able to:

1. Identify and select greenhouses based on structural characteristics
 - a. Explain the history of greenhouses
 - b. Identify glazing materials
 - c. Analyze desirable attributes of various greenhouse structures
 - d. Select suitable beds and benches
2. Explain the operation and benefit of equipment and technology used in greenhouse structures
 - a. Operate fertilizer injectors
 - b. Operate heating and cooling systems
 - c. Explore high-end technology opportunities in the greenhouse industry
3. Describe alternative cropping systems
 - a. Identify economically viable systems
 - b. Identify crops best suited for alternative systems
 - c. Assemble hydroponic systems
4. Calculate heating and cooling requirements for greenhouse structures
 - a. Compare and contrast heating and cooling systems
 - b. Using formulas, calculate heating and cooling output
 - c. Analyze the effect of glazing materials on heating and cooling
5. Identify the virtues of various types of media
 - a. Identify the different medias used in greenhouses by sight and texture
 - b. Compare and contrast the water holding capacity of different medias
 - c. Explain the importance of bulk density

6. Explain fertilizer programs and calculations
 - a. Identify the essential elements and trace elements
 - b. Identify common fertilizer formulations
 - c. Calculate ppm
7. Discuss the important of light and temperature on production
 - a. Explain photoperiodism and thermoperiodism
8. Develop production schedules for various greenhouse crops
 - a. Explain the importance of scheduling
 - b. Identify the key concepts of crop scheduling

MAPPING LEARNING OUTCOMES TO GENERAL EDUCATION GOALS

[For each of the goals selected above, indicate which outcomes align with the goal.]

Goals	Outcomes
First Goal	
To apply analytical and problem solving skills to personal, social, and professional issues and situations	<ol style="list-style-type: none"> 1. Identify and select greenhouses based on structural characteristics <ol style="list-style-type: none"> a. Explain the history of greenhouses b. Identify glazing materials c. Analyze desirable attributes of various greenhouse structures d. Select suitable beds and benches 3. Describe alternative cropping systems <ol style="list-style-type: none"> a. Identify economically viable systems b. Identify crops best suited for alternative systems c. Assemble hydroponic systems 4. Calculate heating and cooling requirements for greenhouse structures <ol style="list-style-type: none"> a. Compare and contrast heating and cooling systems b. Using formulas, calculate heating and cooling output c. Analyze the effect of glazing materials on heating and cooling 5. Identify the virtues of various types of media <ol style="list-style-type: none"> a. Identify different medias used in greenhouses by sight and texture b. Compare and contrast the water holding capacity of different medias c. Explain the importance of bulk density 6. Explain fertilizer programs and calculations <ol style="list-style-type: none"> a. Identify the essential elements and trace elements b. Identify common fertilizer formulations c. Calculate ppm 7. Discuss the importance of light and temperature on production

	<ul style="list-style-type: none"> a. Explain photoperiodism and thermoperiodism 8. Develop production schedules for various greenhouse crops <ul style="list-style-type: none"> a. Explain the importance of scheduling b. Identify the key concepts of crop scheduling
Second Goal	
To understand and use technology effectively and to understand its impact on the individual and society.	<ul style="list-style-type: none"> 2. Explain the operation and benefit of equipment and technology used in greenhouse structures <ul style="list-style-type: none"> a. Operate fertilizer injectors b. Operate heating and cooling systems c. Explore high-end technology opportunities in the greenhouse industry

COURSE TOPICS AND CONTENT REQUIREMENTS:

1. Greenhouse structures and materials
2. Greenhouse benches and beds
3. Alternative cropping systems
4. Greenhouse heating and cooling
5. Root media
6. Watering and watering systems
7. Fertilization
8. Carbon dioxide
9. Light/lighting
10. Temperature
11. Chemicals (growth regulators/disease/insect)
12. Business management (scheduling, cost accounting)

INSTRUCTIONAL METHODS:

1. Lecture
2. Discussion
3. Groupwork
4. Field trips

INSTRUCTIONAL MATERIALS:

Nelson, Paul. *Greenhouse Operation and Management*. 7th Edition. Pearson, 2012. ISBN: 9780131591707

STUDENT REQUIREMENTS AND METHODS OF EVALUATION:

A= 90-100

B= 80-89

C= 70-79

D= 60-69

F= 0-59

Exams: 40%

Quizzes: 30%

Homework: 20%

Participation: 10%

OTHER REFERENCES

Course Competency/Assessment Methods Matrix

AGR 1226	Assessment Options																																		
For each competency/outcome place an "X" below the method of assessment to be used.	Assessment of Student Learning	Article Review	Case Studies	Group Projects	Lab Work	Oral Presentations	Pre-Post Tests	Quizzes	Written Exams	Artifact Self Reflection of Growth	Capstone Projects	Comprehensive Written Exit Exam	Course Embedded Questions	Multi-Media Projects	Observation	Writing Samples	Portfolio Evaluation	Real World Projects	Reflective Journals	Applied Application (skills) Test	Oral Exit Interviews	Accreditation Reviews/Reports	Advisory Council Feedback	Employer Surveys	Graduate Surveys	Internship/Practicum /Site Supervisor Evaluation	Licensing Exam	In Class Feedback	Simulation	Interview	Written Report	Assignment			
	Direct/ Indirect	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	D	I	I	I	I	D	D									
Assessment Measures – Are direct or indirect as indicated. List competencies/outcomes below.																																			
1a. explain the history of greenhouses								X	X																										X
1b. identify glazing materials								X	X																										X
1c. analyze desirable attributes of various greenhouse structures								X	X																										X
1d. select suitable beds and benches								X	X																										X
2a. operate fertilizer injectors								X	X						X																				X
2b. operate heating and cooling systems								X	X					X																					X
2c. explore high-end technology opportunities in the greenhouse industry								X	X																										X
3a. identify economically viable system								X	X																										X
3b. identify crops best suited for alternative systems								X	X																										X

