

HORT 249 Greenhouse Operations Spring 2021

Number of Credits: 4

Course Description:

Course will focus on the development, organization, infrastructure and operation of production greenhouses while examining different greenhouse structures. Production techniques such as watering, fertilizing, growth regulators, and insect and disease identification and control will be covered.

Pre-/Co-requisites: None

Course Objectives:

- Achieve an insight into the field of greenhouse
- Developing an understanding of the levels of and responsibilities of greenhouse management.
- To understand the general principles of greenhouse crop production
- Learn and understand basic greenhouse structures and be able to discuss the pros and cons of each type of structure.
- Create a layout plan describing structure type, ventilation, heating and cooling and watering systems.

Instructor:

Amy Koehler

Office:

Molberg 27

Office Hours:

By appointment

Phone:

701-228-5605

Email: Amy.koehler@dakotacollege.edu

Lecture Schedule:

MW 11-11:50pm F 11-12:40pm

Textbook(s): *An Introduction to Greenhouse Production*. Second Edition. McMahon, Robert W.
(A PDF of manual will be provided to students by instructor)

Course Requirements:

Class participation (10pts each)

Class Exercises (30 pts each)

3 Lecture Tests (100 pts each)

Field Trip exercises/participation (50 pts)(off campus)

Field Trip Field Trip exercises/participation (30 pts) (on campus)

Industry Interview (150 pts)

Reflective Writing Assignments. (30 points)

Article Discussion (50 points)

Greenhouse layout and management final project (200 points)

- ❖ **Field Trips will be taken as part of this class in order to gain experience and exposure to the Industries involved in Greenhouse Operations.**

GRADING: Grading is based on a standard college curve, where students earn a grade based upon the percent of total possible points they obtain. Any missed quiz, exam or assignment not made up within the allotted time will be given a zero. The “allotted time” given is at the discretion of the instructor and will be communicated to the students throughout the course. (Note: It is the responsibility of the student to schedule make-up work with the instructor at a time convenient to both parties.) Final letter grades are assigned based on the following criteria:

A = 90-100% of the total points

B = 80-90% of the total points

C = 70-80% of the total points

D = 60-70% of the total points

F = <60% of the total points

Reflective Writing Assignments will be assigned with prompts throughout the semester and graded based on a rubric that looks for addressing of prompt, depth of understanding, use of technical information, language use, and overall synthesis of content. This is a powerful learning tool as it integrates experience with knowledge gathering and seeks to integrate the two to demonstrate higher level learning than what would be assessed in examinations.

Tentative Course Outline:

- ❖ **Sometime in February and April students will be attending Mandatory Field Trips to the International Peace Gardens.**
 - **Identification required for entrance to the Peace Gardens is preferably a passport or passport card, if you don't have one of these, you will need photo ID and an official birth certificate.**
- ❖ **Note Sometime in March or April there will be scheduled a mandatory field trip to Lowe's Floral and Garden Center, Minot ND.**
- ❖ **Students will be required to attend multiple “field trips” on DCB campus throughout the semester where they will tour and explore the DCB Greenhouse and High tunnel facilities.**

All Field Trips are Tentative to Cancellation due to COVID-19 Restrictions

| Week | Topics and Assignments |
|--------------------------|---|
| 1 | <p>Introduction to the course Lecture: Overview of the Greenhouse Industry Reading:</p> <ul style="list-style-type: none"> • Chapter 1 Overview of Greenhouse Industry pg. 1-24 • Floriculture World Wide; Production, trade and consumption patterns show market opportunities and challenges (PDF provided) <p>The Secret Language of Plants: Nat Geo Video https://youtu.be/csKVYqV95rk</p> |
| 2 No School Monday | <p>Lecture: Greenhouse construction Reading: -Chapter 2 Greenhouse Structures pg 25-42, https://youtu.be/ATCDuBOUdbQ https://youtu.be/viETj2N5qjs</p> |

| Week | Topics and Assignments |
|---|--|
| 3 | Lecture , High Tunnel Construction and Production Reading: USDA SARE High Tunnels and Other Season Extension Techniques https://youtu.be/5xwp2zyGjxM |
| 4 | Lecture: , Heating the Greenhouse Environment, Reading: Chapter 3 Controlling the Greenhouse Environment pg. 45-82 https://youtu.be/5xwp2zyGjxM |
| 5 | Lecture: Catch-up, Video and Worksheet “Living Soil” Film https://youtu.be/ntJouJhLM48 Test Review : Overview of the Greenhouse Industry, Greenhouse Structure, High Tunnel Construction and Production, Heating the Greenhouse Environment, “Living Soil” Film |
| 6 No School Monday | Test: : Overview of the Greenhouse Industry, Greenhouse Structure, High Tunnel Construction, Heating the Greenhouse Environment, “Living Soil” Film *Tour of the DCB Greenhouse heating facilities |
| 7 | Lecture: Greenhouse Cooling Equipment Reading: <ul style="list-style-type: none"> • Refresh/ Read Chapter 3 Controlling the Greenhouse Environment pg. 45-82 • Greenhouse Temperature Management by AJ Both (Rutgers) PDF provided https://youtu.be/zNxsFODU_VQ https://youtu.be/KdgXfH5wKTQ |
| 8 | Lecture: Greenhouse Lighting, Greenhouse Irrigation Systems Reading: Chapter 5 Greenhouse Irrigation Systems pg. 103-120 -Chapter 4 Greenhouse Equipment and Lighting p.g 87-97 -Science advances in matching LED lighting to horticultural needs (MAGAZINE) LEDs |
| 9 Industry Interview Due March 22nd | Lecture: Root Media and Containers, Nutrition Reading: Chapter 6 Root Media -Chapter 7 Nutrition pg. 157-171 -Chapter 8 Integrated Pest Management pgs. 177-187 and Containers pg. 127-151 *Tour of DCB Greenhouse lighting, media and irrigation equipment |
| March 15-19 | Spring Break |
| 10 Test Week | Review of Test Test: Greenhouse Cooling Equipment and Lighting, Greenhouse Irrigation Systems, Root media and Containers, Nutrition, |
| 11 | Lecture: Integrated Pest Management, Bedding Plant Production *fertilizer calibration exercise in DCB Greenhouse. Reading: Chapter 10 “Bedding Plant Production” pgs. 197-229 |

| Week | Topics and Assignments |
|------|---|
| 12 | Lecture: Cut Flower Production Reading: Chapter 13 “Cut Flower Production” pgs. 339-350 |
| 13 | Lecture: Specialty Crop High Tunnel Production Reading: TBA |
| 14 | Lecture: Hydroponics and Aquaponics Reading: TBA |
| 15 | Make-up/Review Week *Tour of DCB Greenhouse Bedding plant and hydroponics/aquaponics production Final Projects |
| 16 | Test Review Final Test: Bedding Plant Production, Cut Flower Production, Specialty Crop High Tunnel Production, Hydroponics and Aquaponics |

CTE Competency/Department Learning Outcome(s):

- Employ industry-specific skills in preparation for workplace readiness
- Combine general education and vocational skills curriculum

Horticulture LO 2. Demonstrate critical thinking and decision making skills.

Relationship to Campus Focus:

All aspects of horticulture develop an appreciation for nature and the materials that Mother Nature and technology have provided for us. Because of this we are able to make the world a more beautiful place

Classroom Policies:

Plagiarism: The strength Dakota College at Bottineau depends on academic and personal integrity. In this course, you must be honest and truthful. Plagiarism is the use of someone else’s work, words, or ideas as if they were your own. Here are three reasons not to do it:

- By far the deepest consequence to plagiarizing is the detriment to your intellectual and moral development: you won’t learn anything, and your ethics will be corrupted.
- Giving credit where it’s due but adding your own reflection will get you higher grades than putting your name on someone else’s work. In an academic context, it counts more to show your ideas in conversation than to try to present them as *sui generis*.
- **This means absolutely not cut and pasting directly into your assignment from other sources. I want everything is your own words!**
- Finally, all students are expected to adhere to the highest standards of academic integrity. Students must complete all work themselves. Cheating or plagiarism is a serious offense and is subject to disciplinary action by the instructor and the college administration. Please be sure to review the **Student Handbook**. **The consequences of plagiarism in this class depend on the level exhibited, but are at a minimum a failing grade on the assignment up to failing the class.**

Student Email Policy:

Dakota College at Bottineau is increasingly dependent upon email as an official form of communication. A student's campus-assigned email address will be the only one recognized by the Campus for official mailings. The liability for missing or not acting upon important information conveyed via campus email rests with the student.

Academic Integrity:

According to the DCB Student Handbook, students are responsible for submitting their own work. Students who cooperate on oral or written examinations or work without authorization share the responsibility for violation of academic principles, and the students are subject to disciplinary action even when one of the students is not enrolled in the course where the violation occurred. The Code detailed in the Academic Honesty/Dishonesty section of the Student Handbook will serve as the guideline for cases where cheating, plagiarism or other academic improprieties have occurred.

Disabilities or Special Needs:

Students with disabilities or special needs (academic or otherwise) are encouraged to contact the instructor and Disability Support Services.

Title IX:

Dakota College at Bottineau (DCB) faculty are committed to helping create a safe learning environment for all students and for the College as a whole. Please be aware that all DCB employees (other than those designated as confidential resources such as advocates, counselors, clergy and healthcare providers) are required to report information about such discrimination and harassment to the College Title IX Coordinator. This means that if a student tells a faculty member about a situation of sexual harassment or sexual violence, or other related misconduct, the faculty member must share that information with the College's Title IX Coordinator. Students wishing to speak to a confidential employee who does not have this reporting responsibility can find a list of resources on the DCB Title IX webpage.