NRM 212
GREENHOUSE MANAGEMENT
Spring – 2021

Schedule

Monday 2:15 PM - 5:15 PM, Arctic Health Research Building room 1W05

Online via Zoom may be used for some or all class sessions. If possible, in person participation in AHRB room 1W05, is preferred .

Zoom link: https://alaska.zoom.us/j/85185836945
Phone number if needed for audio using Zoom: 669-900-6833 or 253-215-8782
(Meeting ID: 851 8583 6945, Passcode: 490757)

Course Objective:

To guide students to an understanding of greenhouses and other controlled environment production systems with emphases on use, applications, management and operation.

Expected Student Outcome:

Students should understand major design and construction requirements for a greenhouse to function as an efficient growing environment for various crops. Students should also understand environmental control systems and management practices such as media, irrigation, fertilization, crop production systems and pest management. Students should have ability to recognize and appreciate opportunities and challenges for efficient greenhouse use under northern conditions.

Instructor:

Dr. Meriam Karlsson, Professor of Horticulture
Office: 1W04 Arctic Health Research Bldg., 474-7005, mgkarlsson@alaska.edu
Office hours: Tuesday and Thursday 10 am - 12 noon or by appointment

WEB:

Blackboard https://classes.alaska.edu/

Virtual Grower 3
http://www.ars.usda.gov/services/software/download.htm?softwareid=309

Recommended Text:

Greenhouse Operation and Management, 7th ed., by Paul V. Nelson, 2012, Prentice Hall, Pearson Higher Education, ISBN 9780132439367
(list price new $270).

Supplemental Text:

Greenhouse Engineering, 3rd revision, by R.A. Aldrich and J.W. Bartok Jr., 1994, NRAES-33, Ithaca, NY. (http://host31.spidergraphics.com/nra/doc/Fair%20Use%20Web%20PDFs/NRAES-33_Web.pdf)

Greenhouse Technology and Management, 2nd ed., by N. Castilla, 2012, CABI, Boston.

Greenhouses, Advanced Technology for Protected Horticulture, by J.J. Hanan, 1998, CRC PressBoca Raton, Florida.

Evaluation Policy:

Grades will be based on exams, one literature review, the greenhouse design project and class participation. The relative importance of each component for the final grade is indicated below:

Exam I	200 (20%)
Exam II	200 (20%)
Final Exam	300 (30%)
Greenhouse Design Project	200 (20%)
Literature Review	50 (5%)
Class Participation	50 (5%)
	1,000 points (= 100%)

Letter grades will be determined using the following scale:

A	90.0	to 100	%
B	80.0	to 89.9	%
C	70.0	to 79.9	%
D	60.0	to 69.9	%
F	Below	59.9	%

Borderline grades may be curved based on class participation, attendance and student progress during the semester. No make-up exams will be given unless there is a verifiable emergency or arrangements have been made with the instructor prior to the scheduled due date and time.

Literature Review:

One literature review based on a paper from a scientific journal covering a research study related to the construction, management or environmental conditions of a greenhouse or other controlled environment is required. In addition to the written review, a short presentation of the paper (less than 10 minutes) is expected. The literature review is due (at the latest) March 15 with the presentation March 22, 2021.

Format for Literature Review (see example on Blackboard)

Title of the article
Author(s)
Journal (name, year, page numbers)
Purpose of experiment
Procedures
Results and conclusions
Are the authors' conclusions valid? Who would benefit from this information? What additional work should be done? What would you have done differently? Any other comments.

Greenhouse Design Project:

Here you will have the opportunity to develop a design plan for a greenhouse that will be useful to you. The design and report should be comprehensive starting with the purpose and goals for your greenhouse. Other expected components besides the design and construction specifics such as size, location and type of greenhouse, include the purpose and use, management, business versus recreational, heating, cooling and irrigation approach, environmental controls, annual crop production plan, labor requirements, logistics and marketing methods (if applicable).

An outline for the design project is posted on Blackboard under the heading Greenhouse Design Guidelines. Many of the expected components are covered in the publication Creating a Master Plan for Greenhouse Operations by A.J. Both (http://njaes.rutgers.edu/pubs/publication.asp?pid=E221).
The Greenhouse Design Project is due on April 19 with a short presentation on April 26, 2021 (last day of instruction).

Academic Honesty:

As described by UAF, scholastic dishonesty constitutes a violation of the university rules and regulations and is punishable according to the procedures outlined by UAF. Scholastic dishonesty includes, but is not limited to, cheating on an exam, plagiarism, and collusion. Cheating includes providing answers to or taking answers from another student. Plagiarism includes use of another author's words or arguments without attribution. Collusion includes unauthorized collaboration with another person in preparing written work for fulfillment of any course requirement. Scholastic dishonesty is punishable by removal from the course and a grade of "F." For more information go to Student Code of Conduct (https://www.uaf.edu/handbook/community/codeconduct.php)

Notice of Nondiscrimination:

UA is an AA/EO employer and educational institution and prohibits illegal discrimination against any individual: https://www.alaska.edu/nondiscrimination

Support Services

Please consult the Student Handbook for topics like: academic advising, tutoring, library and academic support, disability services, computing and technology, veteran and military support, academic complaint and appeals, late withdrawals, "classroom" behavior expectations and more.

UAF Help Desk. Go to https://www.alaska.edu/oit/ to see current network outages and technology news. For technical questions, contact the Help Desk at:

- e-mail at helpdesk@alaska.edu
- phone: 450.8300 (in the Fairbanks area) or 1.800.478.8226 (outside of Fairbanks)

Student Protections and Services:

UAF embraces and grows a culture of respect, diversity, inclusion, and caring. Students at this university are protected against sexual harassment and discrimination (Title IX). Faculty members are designated as responsible employees which means they are required to report sexual misconduct. For more information on your rights as a student and the resources available to you to resolve problems, please go to the following site:
https://catalog.uaf.edu/academics-regulations/students-rights-responsibilities/

All of us have strengths and weaknesses when it comes to learning. If you have a particular learning disability that may interfere with your ability to perform the work in this course, I am happy to make reasonable accommodations. Please obtain an Accommodation Letter from Disabilities Services (ext.5655, uaf-disability-services@alaska.edu). Accommodations will not be made retroactively (i.e. if you need additional time to complete the exams, you must present the letter *before* any exams are administered). I appreciate your cooperation.
For more information on your rights as a student and the resources available to resolve problems, please see the Student Handbook (https://www.uaf.edu/handbook/).

COVID-19:

Students should keep up-to-date on university policies, practices and mandates related to COVID-19 by regularly checking the website:
https://sites.google.com/alaska.edu/coronavirus/uaf/uaf-students?authuser=0

Further, students are expected to adhere to the university's policies, practices, and mandates and are subject to disciplinary actions if they do not comply.

NRM 212-Spring 2021, tentative schedule (pages Nelson, 2012. Greenhouse Operation and Management, 7th ed.)

January 11	Course introduction Greenhouse definitions and industry characteristics	p. 1-33
January 18	No class (Alaska Civil Rights Day)	
January 25	Greenhouse designs and construction	p. 35-76
February 1	Greenhouse heating	p. 77-123
February 8	Greenhouse cooling and environmental control systems	p. 125-149, 151-159
February 15	Root substrates	p. 161-194, 195-209
February 22	**First Take-Home Exam** Watering	p. 211-260
March 1	Fertilization and carbon dioxide	p. 261-318, 319-327
March 8	No class (Spring Break)	
March 15	Light and temperature **Literature review is due**	p. 330-372
March 22	Light and temperature **Literature presentations**	p. 330-372
March 29	Regulation of plant growth	p. 373-389
April 5	Pest and disease management	p. 391-442, 443-462
April 12	**Second Take-Home Exam** Postproduction quality	p. 463-488
April 19	Marketing and business management **Greenhouse design project is due**	p. 489-530, 531-586
April 26	**Presentations and discussion of your greenhouse designs** (last day of instruction)	
April 30	**Final Take-Home Exam is due**	

(scheduled Final Exam during Finals' week is on Thursday April 29, 1:30-4 pm)
