

**NRM 212**  
**GREENHOUSE MANAGEMENT**  
**Spring – 2018**

**Schedule**

Monday            2:15 PM - 5:15 PM, AHRB 1W05

**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

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*Office hours:* Tuesday and Thursday 10 am -12 noon or by appointment, 1W04 AHRB

**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 \$267.00, rent used \$106.80).

**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](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 Press Boca Raton, Florida.

Greenhouses for Homeowners and Gardeners, by J.W. Bartok, Jr., 2000, NRAES-137, Ithaca, NY

**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	<u>50 (5%)</u>
	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.

**Student Code of Conduct:**

The UAF Student Code of Conduct includes the following common guidelines regarding academic integrity:

1. Students will not collaborate on any quizzes, in-class exams, or take-home exams that contribute to their grade in a course, unless the course instructor grants permission. Only those materials permitted by the instructor may be used to assist in quizzes and examinations.
2. Students will not represent the work of others as their own. A student will attribute the source of information not original with himself or herself (direct quotes or paraphrases) in compositions, theses, and other reports.
3. No work submitted for one course may be submitted for credit in another course without the explicit approval of both instructors.

Alleged violations of the Code of Conduct will be reviewed in accordance with procedures specified in regents' policy, university regulations and UAF rules and procedures. For additional information and details about the Student Code of Conduct, contact the associate vice chancellor for student and enrollment services, visit [www.alaska.edu/bor](http://www.alaska.edu/bor) or refer to the student handbook that is printed in the back of the class schedule for each semester. Students are encouraged to review the entire code.

### **Grading policy information, 2017-18 catalog**

(<http://catalog.uaf.edu/services/disability-services>)

The Disability Services program, in 208 Whitaker, provides services to students with documented disabilities on the Fairbanks campus as well as the Bristol Bay, Chukchi, Interior Alaska, Kuskokwim, Northwest, and Community and Technical College campuses, Distance Education, and the College of Rural and Community Development. The goal of Disability Services is to ensure equal access to educational opportunities at UAF. Academic accommodations are free and available to any student who qualifies as an individual with a disability and is enrolled in at least 1 credit hour. Disability Services operates an assistive technology lab with specialized software. UAF has an accessible shuttle bus service equipped with a wheelchair lift for transportation on campus, and most campus buildings are accessible. For more information contact Disability Services at [907-474-5655](tel:907-474-5655) or [907-474-1827](tel:907-474-1827) (TTY), email [uaf-disability-services@alaska.edu](mailto:uaf-disability-services@alaska.edu) or visit <http://www.uaf.edu/disability/>.

### **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 19 with the presentation March 26, 2018.

*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 23 with a short presentation on April 30, 2018 (last day of instruction).



**NRM 212-Spring 2018, tentative schedule** ([pages Nelson, 2012. Greenhouse Operation and Management, 7th ed.](#))

January 22	Course introduction, Greenhouse definitions and industry characteristics	p. 1-33
January 29	Greenhouse designs and construction	p. 35-76
February 5	Greenhouse heating	p. 77-123
February 12	Greenhouse cooling and environmental control systems	p. 125-149, 151-159
February 19	Root substrates	p. 161-194, 195-209
February 26	<b>First Take-Home Exam</b> Watering	p. 211-260
March 5	Fertilization and carbon dioxide	p. 261-318, 319-327
March 12	Spring Break	
March 19	Light and temperature <b>Literature review is due</b>	p. 330-372
March 26	Light and temperature <b>Literature presentations</b>	p. 330-372
April 2	Regulation of plant growth	p. 373-389
April 9	Pest and disease management	p. 391-442, 443-462
April 16	<b>Second Take-Home Exam</b> Postproduction quality	p. 463-488
April 23	Marketing and business management <b>Greenhouse design project is due</b>	p. 489-530, 531-586
April 30	<b>Presentations and discussion of your greenhouse designs</b>	
May 4	<b>Final Take-Home Exam is due</b> (scheduled Final Exam during Finals' week is on Friday May 4, 1-3 pm)	