

NRM 211  
INTRODUCTION TO APPLIED PLANT SCIENCE  
Fall – 2016

Schedule

Lectures	Monday, Wednesday	9:15AM - 10:15AM	AHRB 183
Labs	Monday	2:15PM - 5:00 PM	AHRB 1W05

Course Objective

To guide students to an understanding of the physiological processes controlling plant growth and development emphasizing the implications and applications for plant growth and production at high latitudes.

Expected Student Outcome

Enable students to apply current scientific knowledge to effectively handle and understand plant growth under existing environmental conditions, management practices and infrastructures. Provide students with the ability to recognize and appreciate opportunities and challenges for efficient plant and crop production under northern conditions.

Instructor :

Dr. Meriam Karlsson, Professor of Horticulture  
Office 1W04 Arctic Health Research Bldg, Phone 474-7005, Email: mgkarlsson@alaska.edu  
Office hours Tuesday and Thursday 10 am – noon, or by appointment, 1W04 AHRB  
Tuesday 2-4 pm, Academic Advising Center, 510 Gruening Bldg.

WEB: Blackboard <http://classes.uaf.edu/>

Recommended (not required) Text

Stern's Introductory Plant Biology, 13th ed. by James E. Bidlack and Shelley H. Jansky, 2014, McGraw Hill, ISBN: 9780073369440 (list price new \$208.50, rent hard copy \$111.10).

Supplemental Text

Raven Biology of Plants, 8th ed. by Ray F. Evert and Susan E. Eichhorn, 2013, W.H. Freeman Publishers.

Hartmann's Plant Science: Growth, Development and Utilization of Cultivated Plants, 5th ed. by Margaret E. McMahon, Anthony M. Kofranek and Vincent E. Rubatzky, 2010, Pearson Prentice Hall.

The Biology of Horticulture, An Introductory Textbook, 2nd ed. by John E. Preece and Paul E. Read, 2005, Wiley & Sons.

Principles of Field Crop Production, 4th ed. by John Martin, Richard P. Waldren and David L. Stamp, 2006, Pearson Prentice Hall.

Evaluation Policy:

Grades will be based on exams, plant identifications, several sets of lab questions, one lab activities report, one literature review, and class participation. The relative importance of each component for the final grade is indicated below:

Exam I	100 (10%)	
Exam II	150 (15%)	
Final Exam	250 (25%)	
Lab	400 (40%)	
Lab and Plant ID I	(150 or 15%)	
Lab and Plant ID II	(150 or 15%)	
Several sets of -321T		250 (25%)

## Plant ID and Lab Tests

The first part of the Lab and plant ID tests on October 3 and November 7 consists of questions from lab exercises. These questions will constitute 20% or 30 points of the 150 possible points. The second part is identification of plants in form of pictures, pressed samples or live plant material. Common names and scientific names (correctly spelled) are required for each plant. The plant ID includes 6 groups of plants (agronomy crops; invasive species commonly referred to as weeds; native Alaska plants for ornamental and revegetation purposes; vegetables; herbaceous ornamentals; fruit and berry crops) for a total of 100 species.

## Lab Questions

In addition to the lab activities report (see below), there are several weekly sets of lab questions. The questions are related to the most important concepts covered in the lab. The answered lab questions are due at the end of the lab period and will be assigned for lab I, II, III, IV, VI, VII, VIII, IX, XI and XII.

## Lab Activities Report:

One lab activities report describing effects of temperature, light and mineral nutrition on plant growth is required. The plants will be growing in the greenhouse throughout the semester with opportunities to make weekly observations and measurements. The report is due (at the latest) on November 16, 2016.

Format for Lab Report on temperature and light (see example on Blackboard)

### Procedures:

- Describe equipment, materials, methods etc.
- Describe treatments.
- Describe how data were collected.

### Results:

Report your observations. The lab report must have actual plant measurements presented in tables and/or graphs.

### Discussion and Conclusions:

- Summarize in words the data presented under the results.
- Discuss the obtained results. Do they differ from expected results?
- Make a few concluding remarks.

## Literature Review:

One literature review based on a paper from a scientific journal covering a research study related to the development and management of a crop or plant system 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) November 28, 2016, with a short presentation during the lab period.

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.



M	Aug. 29	Course introduction.	p. 2-12
M	Aug. 29	Lab I: Field production	
W	Aug. 31	Origin of cultivated plants	p. 250-252, 456-457
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M	Sept. 5	Labor Day – no class or lab	
W	Sept. 7	Plant nomenclature and systematics	p. 128, 282-297, (A1-A19)
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M	Sept. 12	Plant cell and tissue structures	p. 29-44, 53-64
M	Sept. 12	Lab II: Greenhouses	
W	Sept. 14	Plant growth substances (hormones)	p. 191-200
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M	Sept. 19	Plant growth substances (hormones)	p. 191-200
M	Sept. 19	Lab III: Start plant nutrient experiment	
W	Sept. 21	Control of plant growth and development	p. 201-209
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M	Sept. 26	Light measurements for plant growth	p. 168-169, 172
M	Sept. 26	Lab IV: Growth regulators	
W	Sept. 28	Light quality and plant growth	p. 169-17, 210-212
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M	Oct. 3	Light duration (photoperiod) and plant growth	p. 209-212
M	Oct. 3	Lab V:	

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M Nov. 21 Properties of water p. 17-20, 488  
M Nov. 21 Lab XII: Mineral nutrition  
W Nov. 23 EXAM II (Thanksgiving, Nov. 24-27)

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M Nov. 28 Water relations in plants p. 148-159  
M Nov. 28 Lab XIII: Literature reviews are due with a short presentation  
W Nov. 30 Soil water p. 82

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-M Dec. 5 Alaska crop production  
M Dec. 5 Lab XIV: Fruit types  
W Dec. 7 FINAL EXAM (Scheduled Final Exam - Wednesday Dec. 14, 8-10 am)

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