NRM 211
INTRODUCTION TO APPLIED PLANT SCIENCE
Fall – 2014

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 procedures 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
Wednesday noon-2 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 Bidlack and Jansky, 2014, McGraw Hill (list price new $238.00).

Supplemental Text:

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

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

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

Principles of Field Crop Production, 4th ed. by Martin, Waldren and 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 Lab Questions	(50 or 5%)	
Lab Activities Report	(50 or 5%)	
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 exam 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, please refer to the 2014-15 catalog www.uaf.edu/catalog/catalog_14-15/pdf/04_Academics.pdf.

Student Disability Services:

In collaboration with UAF Office of Disability Services, 208 Whitaker Bldg. (across from Wood Center), 474-5655 or uaf-disabilityservices@alaska.edu, reasonable accommodations will be made to assist students with documented disabilities.

Lab and Plant ID Tests:

The first part of the Lab and plant ID tests on October 6 and November 10 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; undesired plants in crop production 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 administered 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 19, 2014.

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 26 with the presentation during the lab period on December 1, 2014.

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.

NRM 211-Fall 2014, tentative schedule (pages Bidlack and Jansky, 2014. Stern's Introductory Plant Biology, **13th ed.**)

M	Sept. 8	Course introduction.	p. 2-12
M	**Sept. 8**	**Lab I: Field production**	
W	Sept. 10	Origin of cultivated plants	p. 250-252, 456-457
M	Sept. 15	Plant nomenclature, classifications and systematics	p. 128, 282-297, (A1-A19)
M	**Sept. 15**	**Lab II: Greenhouses**	
W	Sept. 17	Plant cell and tissue structures	p. 29-44, 53-64
M	Sept. 22	Plant growth hormones for growth and development	p. 192-200
M	**Sept. 22**	**Lab III: Start plant nutrient experiment**	
W	Sept. 24	Plant growth substances (hormones)	p. 192-200
M	Sept. 29	Plant growth substances (hormones)	p. 192-200
M	**Sept. 29**	**Lab IV: Growth regulators**	
W	Oct. 1	Control of plant growth and development	p. 201-209
M	Oct. 6	Light measurements for plant growth	p. 168-169, 172
M	**Oct. 6**	**Lab V**: **Lab and plant ID I**	
W	Oct. 8	Light quality and plant growth	p. 169-170, 210-212
M	Oct. 13	Light duration (photoperiod) and plant growth	p. 209-212
M	**Oct. 13**	**Lab VI: Light**	
W	Oct. 15	Plant response to photoperiod	
M	Oct. 20	Plant response to photoperiod (continued)	
M	**Oct. 20**	**Lab VII: Germination and seedling vigor**	
W	**Oct. 22**	**EXAM I**	
M	Oct. 27	Plant response to daily light duration	
M	**Oct. 27**	**Lab VIII: Temperature**	
W	Oct. 29	Photosynthesis and respiration	p. 170-180, 180-190
M	Nov. 3	Temperature and plant growth	p. 212-213, A77
M	**Nov. 3**	**Lab IX: Physical properties of soils**	
W	Nov. 5	Plant response to high and low temperatures	p. 183
M	Nov. 10	Plant response to day, night and average temperatures	
M	**Nov. 10**	**Lab X: Lab and plant ID II**	
W	Nov. 12	Chemical soil properties, mineral nutrition	p. 20, 82
M	Nov. 17	Essential macro- and micronutrients	p. 159-163, 489-491
M	**Nov. 17**	**Lab XI: Mineral nutrition**	
W	Nov. 19	Physical properties of soils	p. 78-82
		Literature review is due	
M	Nov. 24	Properties of water	p. 17-20, 488
M	**Nov. 24**	**Lab XII: Marketing Alaska grown products**	
		Lab Report is due	
W	**Nov. 26**	**EXAM II** (Thanksgiving, Nov. 27-28)	
M	Dec. 1	Water relations in plants	p. 148-159
M	**Dec. 1**	**Lab XIII: Literature reviews**	
W	Dec. 3	Soil water	p. 82
M	Dec. 8	Alaska crop production	
M	**Dec. 8**	**Lab XIV: Fruit types**	
W	**Dec. 10**	**FINAL EXAM** (Scheduled Final Exam - Wednesday Dec. 17, 8-10 am)	