COURSE SYLLABUS

PSSC 274 GREENHOUSE MANAGEMENT

Fall 2017  Lecture & Lab: Friday 12:00 (Noon) – 5:00 pm
Instructor: Jean Miller  Meeting Location: Farm Greenhouses: Farm Headhouse
Email: jsmiller1@csuchico.edu  Office hours: F 11:00 – 12:00, Farm Headhouse

COURSE DESCRIPTION
This course is a survey of the greenhouse industry. Emphasis will be placed on analysis, design, construction and operation of greenhouses and other structures. The relationship of light, temperature, moisture, aeration, and humidity to plant growth will be explored. Greenhouse heating, cooling and environmental control systems will be covered, as well as greenhouse soils, irrigation, fertilization and marketing. Emphasis will be placed on potted plants grown for foliage or flowers, vegetables and bedding plant production.

REQUIRED MATERIALS
1. Textbooks: Ball Redbook, Volume 1: Greenhouses and Equipment, 18th edition and Ball Redbook, Volume 2: Crop Production, 18th edition; available at BMU Bookstore. If you buy an older edition, it may not have the same information discussed in class.

2. Calculator

COURSE REQUIREMENTS
All assigned reading should be completed in advance of lecture so that lectures and labs will be more meaningful.

There will be a short quiz or assignment due at the beginning of each class for 10 points each. The quiz will cover the preceding Friday’s lecture or lab material. If you arrive late, you will not be able to take the quiz without a really great reason. Best to email me before hand.

There will be two mid-terms, 100 points each, consisting of questions and problems derived from lectures, labs, quizzes, readings, discussions and assigned problems used during the course. Exams will include (but not be limited to) multiple choice, true-false, matching, and short-answer questions. Missed exams count as zero. Make-up exams are by arrangement and will be granted only for documented emergencies.

There will be a term paper due on the last day that will take the place of a written final for 150 points. This paper will be more complete than the oral presentation of the information it contains. It will be a summary of the major components of the various topics discussed. We will discuss this in more detail in class.

There will be a crop report presentation by each student during the last two labs of the semester. The presentation format will be power point, limited to 20 minutes and students can use lab time, if available, to prepare it. See the guidelines at the end of this syllabus.
Class participation is expected and required in lecture and lab. An activity card or completed lab assignment (10 points each) will be handed in by each student at the end of each lab. Regular attendance is necessary to your success in this class. Students are not allowed to come and go during class session. Any student who leaves before class is dismissed will receive a zero on that week’s lab attendance. Lab points cannot be made up.

**COURSE GRADING**

Due to privacy concerns, grades will only be discussed in person between the instructor and the student, (not through email or by phone).

<table>
<thead>
<tr>
<th>Assignments</th>
<th>Points possible</th>
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<tbody>
<tr>
<td>Mid-term Exams, 2 @ 100 points each</td>
<td>= 200</td>
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<tr>
<td>Term paper (in place of final)</td>
<td>= 150</td>
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<tr>
<td>Quizzes and assignments, 11 @ 10 points each</td>
<td>= 110</td>
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<tr>
<td>Lab Activities/Attendance, 14 @ 10 points each</td>
<td>= 140</td>
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<tr>
<td>Crop Report Presentation</td>
<td>= 100</td>
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<tr>
<td><strong>Grand Total</strong></td>
<td><strong>= 700</strong></td>
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Individual student grades will be based on the following percentages of the total possible points: (Percentage rounded to closest whole number)

- 100 – 94%  A
- 93 – 90%   A-
- 89 – 87%   B+
- 86 – 83%   B
- 82 – 80%   B-
- 79 – 76%   C+
- 75 – 73%   C
- 72 – 70%   C-
- 69 – 67%   D+
- 66 – 60%   D
- Less than 60%  F

**MISCELLANEOUS INFORMATION**

- Friday lecture and lab are held at the University Farm on Hegan Lane. Lecture will begin promptly at 12:15 to allow for arrival time if students have a class on campus from 11 to 11:50. You must arrange for your own transportation to get to the farm (carpooling is great!). Biking takes 30 to 40 minutes.
- Student parking is in the lot across the street, not next to the greenhouses.
- Students will provide their own transportation for any off-campus field trips. Carpooling!
- The 3 hour lab is usually held outdoors and in the greenhouses. Wear appropriate clothing and footwear. **Closed-toe shoes are required.**
- Students are expected to clean up at the end of lab and could have points deducted for not helping.

**Expected Student Conduct and Classroom Disruption:**

If your behavior is distracting to the professor or students, you will be verbally asked to cease that behavior or leave the facility. Any noises from electronic devices will be considered a class
distraction. **Students are not to talk or text on their phones during class time.** All class participants are expected to exhibit respectful behavior to other students and the professor.

**Plagiarism:**
The students, faculty, administrators and staff of CSU, Chico are committed to a culture of honesty in which members of the community accept responsibility to uphold academic integrity in all they say, write and create.

**GREENHOUSE MANAGEMENT SCHEDULE: Fall 2017**

<table>
<thead>
<tr>
<th>Date</th>
<th>Lecture Topic</th>
<th>Lab</th>
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<tbody>
<tr>
<td>Aug. 25</td>
<td>Introduction to the course; Overview of the greenhouse industry</td>
<td>Tour greenhouses; Propagation of roses</td>
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<tr>
<td>Sept. 1</td>
<td>Greenhouse design and construction</td>
<td>Construction costs; Poinsettia review; Planting of plugs</td>
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<tr>
<td>Sept. 8</td>
<td>Greenhouse cooling and heating</td>
<td>Greenhouse calculations; Seed sowing annuals</td>
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<tr>
<td>Sept. 15</td>
<td>Greenhouse media</td>
<td>Media analysis; Seed sowing tomatoes</td>
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<tr>
<td>Sept. 22</td>
<td>Greenhouse irrigation</td>
<td>Irrigation systems and designs; Pinching of plants</td>
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<td>Sept. 29</td>
<td>Review, 1st exam (after field trip)</td>
<td>Field trip: 5311 Midway, Richvale (Lundberg Rice)</td>
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<tr>
<td>Oct. 6</td>
<td>Fertilization</td>
<td>Fertilization lab; Tomato grafting; Transplanting</td>
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<td>Oct. 13</td>
<td>Light and temperature</td>
<td>Field trip: 2603 Hwy 70, Oroville (Western Tree Nursery)</td>
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<td>Oct. 20</td>
<td>Plant growth regulators (PGR) and calculations</td>
<td>Field trip: 612 E. Gridley Road, Gridley (Agromillora)</td>
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<td>Oct. 27</td>
<td>Pest identification, Integrated Pest Management</td>
<td>Insect ID; Trap placements</td>
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<td>Nov. 3</td>
<td>Review, 2nd exam</td>
<td>Disease ID; Pest scouting and monitoring; Label worksheet</td>
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<td>Nov. 10</td>
<td>No Lecture (Veteran’s Day)</td>
<td>No Lab</td>
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<td>Nov. 17</td>
<td>Production methods, Hydroponics, Aquaponics</td>
<td>Field trip: Chico (hydroponic stores)</td>
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<td>Nov. 24</td>
<td>No Lecture (Thanksgiving week)</td>
<td>No Lab</td>
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<tr>
<td>Dec. 1</td>
<td>Marketing</td>
<td>Presentation of greenhouse reports</td>
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<tr>
<td>Dec. 8</td>
<td>Marketing</td>
<td>Presentation of greenhouse reports</td>
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<tr>
<td>Dec. 11 - 15</td>
<td>Final: turn in term paper- printed</td>
<td>No Lab</td>
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Greenhouse Management- PSSC 274
Oral Presentation & Power Point Guidelines

- Each student will present to the class a 20 minute power point of their ideal greenhouse for the production of a greenhouse crop (list of plants to be discussed).
- Greenhouse crop must be approved by 3rd week of class.
- Students can work in groups of two. Pick your partner wisely.
- Presentations will be scheduled for weeks 15 and 16 during laboratory hours.
- You will be graded upon your ability to research and cite sources properly, understand & communicate the information, and proper use of greenhouse terminology. See point values below.

Components of the presentation:

1. Greenhouse Crop (35 points total)

5 pts- Provide an overview on the history of the use of the crop. Is this crop a long-time standard? Is it a new introduction? How is it sold?
5 pts- Present economic value of the crop. This is a little harder to find. Check out California’s Counties Crop Reports.
15 pts- Discuss the cultivation of the crop including:
   - Propagation technique(s): what is best/most used? Seeds, cuttings, plugs, etc.
   - Best media: any unusual requirements?
   - Fertilization program: what is standard?
   - Irrigation schedule (moisture): how often?
   - Temperature: what is best? Does it change as crop matures?
   - Light: extra light needed? How many hours per day?
   - Plant growth regulators used (if any): what is purpose?
   - Time to finish crop (scheduling): how many days from start to finish?
   - Average cost of production: depends on size of production facility
10 pts- Provide an overview of any insect and disease problems. Include:
   - How are they identified (What do they look like –pictures required)
   - When do they become a problem: at what stage of production (seedling, finishing?)
   - How to best manage them: typical management tactics?

2. Ideal Greenhouse (65 points total)

8 pts- Covering material: What material did you use? You will need to explain your choice, its advantages and disadvantages, and the cost.
5 pts- Benches: What kind you choose depends on their purpose (which you will explain). How many will you need? What are their dimensions and costs? If you don’t need any, you will need to explain why.

8 pts- Heating: What do you want to use? Heaters are rated by the amount of BTUs they produce. In order to determine the correct size of the greenhouse heater you'll need, you will need to gather the following information- the size of your greenhouse, the minimum outside temperature you expect for Chico, the minimum temperature you want to maintain in the greenhouse and the heat loss factor of the covering you choose. You will need to show your calculations and cost of heater.

8 pts- Cooling: For Chico, fan and pads plus vents will handle the summer heat. What optimal size exhaust fan do you need for one air exchange per minute? What kind and size pads do you need? Where are the units placed? If you cover the intake vents with screens for insect control that will change the size of fan(s) needed. What about roof or side vents or HAF fans? Show your calculations and costs of units chosen.

5 pts- Irrigation: I don’t expect you to calculate the cost of the entire irrigation pipe needed but show the cost of specialized equipment such as misters, drip irrigation and/or capillary mats (or whatever you choose). You can’t have just hoses. Explain why you chose the type(s) of irrigation system(s).


5 pts- Media/containers: What kind of containers will be used? Pots, flats, trays? Might depend on what is being grown- cuttings, plugs, 6 pack veggies, etc.? What media should you use and how much do you need? There are charts that show how much media fills certain size containers. What are the costs for containers and media to fill the greenhouse once? Do you want to do hydroponics instead?

5 pts- Additional items: Is there anything else you want? Heating mats? Motorized inlet shutters? These items can add additional value to your presentation.

6 pts- Citing: Use journals, books, and credible (up-to-date) websites. Do not get all of your information from one source (like our text book) and DO NOT PLAGIARIZE. Cite all sources using APA format and use quotes if you do not rephrase using your own words.

5 pts- Presentation delivery and style (did you practice? edit?). Points will be deducted for presentations exceeding 15 minutes or shorter than 10 minutes.

Provide an electronic copy of your presentation on scheduled date of presentation.

We will go over my expectations in class. This is a 100 point assignment!