Physiology of Agronomic Plants (AGR 6442C – 4 Credits): Spring 2013

Diane Rowland
Office: G066 McCarty D
Phone: 229-869-2952
email: dlrowland@ufl.edu (don’t forget the “l” in “dl” – someone is Psychiatry has an email address as “drowland”)

Class Schedule:
Monday 9:35 – 10:25  Agronomy Teaching Farm
Tuesday 10:40 – 12:35 Agronomy Teaching Farm
Wednesday 9:35 – 10:25 Agronomy Teaching Farm
Friday 9:35 – 10:25 Agronomy Teaching Farm

Office Hours:
Officially for 1 hour after every class period, but you can make an appointment via email or phone.

Course Description:
This course examines the yield potential of crop genotypes as influenced by photosynthetic efficiency, respiration, translocation, N metabolism, canopy architecture and the concomitant effects of biotic and abiotic stress in the production environment. It will also provide practical experience using a diverse set of physiological instrumentation for measuring many of these processes in the field. Special emphasis will be given to nutrient and water uptake processes and the effects of water stress on crop physiology.
Topics include:
- Nutrient Uptake
- Nitrogen fixation and metabolism
- Photosynthesis
- Water relations and xylem transport
- Root physiology
- Phloem transport
- Stomatal control
- Environmental effects and stress physiology
- Growth and development
- Physiological basis of yield

Course Objectives:
After completion of the course, students should –

- Understand the fundamental physiological processes associated with crop yield and performance.
- Understand how these processes are affected by the genetic potential of the crop and the environment in which it is grown (G X E interactions).
- Given a practical problem in crop physiology, be able to design a field or greenhouse experiment to answer it by using the appropriate instrumentation and sound statistical design.
Be able to write a research proposal that coherently states the scientific rationale behind the problem to be answered; describes the methodology in crop physiology to be used; has an appropriate budget for the research; and lists likely outcomes from the research.

Be able to give an oral presentation of proposed research and defend the approach.

Be able to use a diverse range of instruments for measuring physiological processes in plants.

Methods of Evaluation:
The primary assignments for this course will consist of an annotated bibliography, a grant proposal, and an oral presentation of the proposed research addressing a real-world problem in crop physiology. First, we will be presented (4 times) with actual problems a crop physiologist might tackle in their job. You will need to research the physiological background science to the problem (and possible solution) and write an annotated bibliography; you will also design an experiment to solve that problem. You will write a grant proposal for your solution and present it to the class. Second on a weekly basis, we will be discussing a recent article from a refereed journal dealing with a topic in crop physiology. You will be responsible for bringing your critique of the article (and be ready to discuss it!) the day we discuss the paper in class. Third, you will be responsible for leading the discussion of one of the papers during the semester. Fourth, there will be lab activities each week that you will participate in using various instruments to measure crop physiology. Fifth, we will have a final exam covering the material presented in class. Here’s the breakdown:

<table>
<thead>
<tr>
<th>Item</th>
<th>Number</th>
<th>Points (each)</th>
<th>Points (total)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Annotated Bibliographies</td>
<td>(4)</td>
<td>10 points</td>
<td>40 points</td>
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<tr>
<td>Grant Proposals</td>
<td>(4)</td>
<td>10 points</td>
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<tr>
<td>Grant Presentation</td>
<td>(4)</td>
<td>10 points</td>
<td>40 points</td>
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<tr>
<td>Paper Summaries</td>
<td>(14)</td>
<td>10 points</td>
<td>140 points</td>
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<tr>
<td>Discussion Leadership</td>
<td>(1)</td>
<td>10 points</td>
<td>10 points</td>
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<tr>
<td>Lab Activities</td>
<td>(12)</td>
<td>5 points</td>
<td>60 points</td>
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<tr>
<td>Final Exam</td>
<td>(1)</td>
<td>20 points</td>
<td>20 points</td>
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TOTAL 350 points

A 90-100%
B 80-89%
C 70-79%
D 60-69%
E Below 60%

*I will provide a grading rubric for the annotated bibliographies, grant proposals, oral presentations, paper summaries, and discussion leadership portions so you’ll know how you will be evaluated (and therefore what to include in each!!).

UF Grading Policies:
https://catalog.ufl.edu/ugrad/current/regulations/info/grades.aspx
**Class Attendance Policy:**
It’s your money – I wouldn’t waste it. I would appreciate it if you could notify me beforehand if you are going to miss class (days not minutes before). We can work together on getting you the information you missed.

**Policy for late or skipped exams/assignments:**
If you have an illness or an emergency of some kind, please notify me as soon as you are able. You will be allowed one week to make-up a skipped exam or complete an assignment under these circumstances.

**Accommodation for students with disabilities:**
I will make every effort to help accommodate people with individual learning or testing needs. Students requesting classroom accommodation must first register with the Dean of Students Office. The Dean of Students Office will provide documentation to the student who must then provide this documentation to the Instructor. This documentation will help determine the eligibility for appropriate classroom accommodations.

**Recommended reference books:**
I will be taking pieces of information from these sources (and referencing them) for my presentations in class. That being said, **there is no official textbook for this course.** However, at this stage in your career, I would advise you to start establishing your reference library. You will find these books indispensable for pieces of information necessary for grant writing, manuscripts, etc. I realize this is the information technology age, but I have saved countless hours searching online for either electronic access to these materials or for facts that took me seconds to look up in the book itself. I’ve even taken some of them into the field with me to reference a particular measurement technique. **If you find some references that are not on this list that you have found helpful in the past, let me know – I will update it (and greatly appreciate the tip).**


**Academic Honesty:**
As a result of completing the registration form at the University of Florida, every student has signed the following statements: “I understand that the University of Florida expects its students to be honest in all their academic work. I agree to adhere to this commitment to academic honesty and understand that my failure to comply with this commitment may result in disciplinary action up to and including expulsion from the University.”