

# **METHODS & APPLICATIONS OF PLANT CELL & TISSUE CULTURE (HOS 6373C)**

## **Spring, 2015, 3 credits**

**COURSE INSTRUCTOR: GLORIA MOORE**  
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<http://www.hos.ufl.edu/mooreweb/>

### **COURSE OBJECTIVES:**

This course is targeted to plant scientists who may wish to use tissue culture and/or produce transgenic plants at some point in their research careers, but do not necessarily want to become experts in this area. These could be scientists whose work is usually more applied, e.g. plant breeders, or researchers whose work is usually more basic, e.g. molecular biologists. Thus, specific objects include:

1. To convey the concepts of plant tissue culture and transformation in lectures.
2. To provide hands-on experience of the most common of these techniques in labs and demonstrations of more advanced or uncommon techniques.
3. To demonstrate how to initiate and perform this kind of research with a crop of choice.
4. In conjunction with these activities, to reinforce concepts of scientific thinking, planning and analysis of experiments, record keeping, literature reading, and presentation of results.
5. An examination of current genetic transformation practices in the industry; and their implications for farmers and consumers.

### **CONTENTS AND ORGANIZATION:**

**Lectures:** will be held in Fifield Hall classroom 2318 on Thursday at 4th period (10:40-11:30 AM).

**Laboratory:** Labs will be held in 1135 Fifield Hall on Thursday. At the present time, two sections are listed for labs, periods 6-7 (12:50-2:45) and 8-9 (3:00-4:55). This is to accommodate all class participants in the lab. If less than 8 people sign up for the course, the laboratory will only be taught once.

**Since grading will be based in large part on lab notebooks and discussions and experiments done during class time, attendance at all lectures and a lab is required. If you are not present, you cannot accomplish the required activities. One missed day will be forgiven, if there is a good excuse. Each additional miss will result in an automatic reduction of your grade of 5 points.**

### **GRADING:**

There will be no formal exams in this course, because I do not think it is necessary to memorize and regurgitate this material. Grading will be based on detailed notebooks, which will collect records of experiments and answers to questions that will be provided (see below) (70%) and classroom participation (30%).

### **LABORATORY STRUCTURE:**

1. We intend to post laboratory exercises on the web site at least one week day before the lab will be done. This will give you a chance to print out and read over the experiment, do necessary calculations, and think about the exercise before you get in the lab.
2. At the start of each lab, the TAs or I will spend about 15 minutes stressing important points and answering questions about the experiment.
3. In the laboratory you will follow the suggested lab procedure and take data in your lab notebook. Before you leave the laboratory you need to get your lab notebook signed by Kim or Katie, in order to verify your attendance and lab work.
4. Many of the experiments will extend over a period of weeks. Outside of class, you will probably need further time to write up results, discussion, conclusions, and answer questions.
5. No make-up labs.
6. During the last session of the class you will hand in your notebooks for grading.

### **NOTEBOOKS:**

You will maintain two notebooks. One will be a bound lab notebook as described below, with consecutive bound pages. In the second notebook, suggested to be a loose leaf binder, contents can be organized by experiment, even though the experiments extend over time, and additional material can be added as desired.

## LAB NOTEBOOK:

**Warning!!! Do not fail to bring your lab notebook to all of the lab sessions.**

- You will keep a laboratory notebook in the style employed by scientists in the real world. A laboratory notebook is a diary of the laboratory work. Although it is anticipated that students will work in pairs in most of the exercises, each student should keep a separate notebook. The notebook must be bound [pages must not be removable]. The best kind of notebook is one that has consecutively numbered pages, and carbons of each page. Entries in the notebook should be made in consecutive order. However, in the kinds of experiments we are doing, results may have to be recorded days or weeks after an experiment is initiated. The carbon system allows one to rearrange notes by experiment in a separate notebook, and also to keep a copy of the data in a separate place to guard against loss.
- The **first page** of both notebooks should be reserved for an **Index**. Since you will only be carrying out only a few experiments in the course, one page will do. All subsequent pages are numbered. Your index entries should indicate, in a line or two, the experiment and where it is located in the book (i.e., the page number). Enter a *title* for each experiment, not just "Experiment 1, Page 1".
- Record in your notebook everything that you do and observe as you carry out the experiment. The goal is to record sufficient information to trace mistakes or for another person to repeat the work exactly as you have done it.
- It is not necessary to write everything that is on the protocols handed out, although these can be included, but any deviations should be recorded. Write in the past tense, not necessarily with complete sentences as long as there is no ambiguity. Fasten into your book any data, e.g. spectrophotometer readings, obtained during the course of the experiment. Use ink, and cross out any errors. Never erase!
- Finally, most entries in your notebook should be written in as the experiment proceeds. You can spend a bit of time before the lab filling in some of the initial details (while you are reading over the experiment the night before, for example), but all details of the experiments and data collected should be recorded while in the lab. It is permissible to analyze data after you have left the lab. Also, there may be questions on the lab protocol sheets that are designed to guide your thinking about the experiment. You should answer these questions and write conclusions where it is applicable.

**In all your decisions about what to put into your lab notebook, remember this guiding rule:**

Your notebook should be a **complete, stand-alone record** of the experiment and its results. Anyone with at least your background in plant science should be able to go into

the lab with **nothing but your notebook to guide them**, carry out the same experiment, and compare their data, calculations, analysis, and final results with yours.

### **SECOND NOTEBOOK:**

Here is where experiments should be written completely, with discussion, analysis, conclusions, and answers to questions, all organized by experiment. After the class is over, this will also be a place to maintain class notes and handouts.

### **INFORMATION SOURCES:**

#### **READINGS:**

No textbook has been designated as required. Detailed handouts, culled from a number of sources, on each subject discussed will be made available, principally on the web site.

#### **INSTRUCTOR OFFICE HOURS:**

I will be available for consultation and discussions on Thursday during lab periods or by appointment at other times.

### **OFFICIAL UNIVERSITY STATEMENTS:**

#### **ACADEMIC HONESTY:**

As a student at the University of Florida, you have committed yourself to uphold the Honor Code, which includes the following pledge: "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honesty and integrity." You are expected to exhibit behavior consistent with this commitment to the UF academic community, and on all work submitted for credit at the University of Florida, the following pledge is either required or implied: "On my honor, I have neither given nor received unauthorized aid in doing this assignment."

It is assumed that you will complete all work independently in each course unless the instructor provides explicit permission for you to collaborate on course tasks (e.g. assignments, papers, quizzes, exams). Furthermore, as part of your obligation to uphold the Honor Code, you should report any condition that facilitates academic misconduct to appropriate personnel. It is your individual responsibility to know and comply with all university policies and procedures regarding academic integrity and the Student Honor Code. Violations of the Honor Code at the University of Florida will not be tolerated. Violations will be reported to the Dean of Students Office for consideration of disciplinary action. For more information regarding the Student Honor Code, please see: <https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/>

#### **UF COUNSELING SERVICES:**

Resources are available on-campus for students having personal problems or lacking

clear career and academic goals which interfere with their academic performance. These resources include:

University Counseling Center, 301 Peabody Hall, 392-1575, personal and career counseling;

Student Mental Health, Student Health Care Center, 392-1171, personal counseling; Sexual Assault Recovery Services (SARS), Student Health Care Center, 392-1161, sexual assault counseling; and Career Resources Center, Reitz Union, 392-1601, Career development assistance and counseling.

### **SOFTWARE USE:**

All faculty, staff, and students of the University are required and expected to obey the laws and legal agreements governing software use. Failure to do so can lead to monetary damages and/or criminal penalties for the individual violator. Because such violations are also against University policies and rules, disciplinary action will be taken as appropriate.

### **CAMPUS HELPING RESOURCES:**

Students experiencing crises or personal problems that interfere with their general well-being are encouraged to utilize the university's counseling resources. The Counseling & Wellness Center provides confidential counseling services at no cost for currently enrolled students. Resources are available on campus for students having personal problems or lacking clear career or academic goals, which interfere with their academic performance.

- *University Counseling & Wellness Center, 3190 Radio Road, 352-392-1575, [www.counseling.ufl.edu/cwc/](http://www.counseling.ufl.edu/cwc/)*  
Counseling Services  
Groups and Workshops  
Outreach and Consultation  
Self-Help Library  
Training Programs  
Community Provider Database
- Career Resource Center, First Floor JWRU, 392-1601, [www.crc.ufl.edu/](http://www.crc.ufl.edu/)

### **SERVICES FOR STUDENTS WITH DISABILITIES:**

The Disability Resource Center coordinates the needed accommodations of students with disabilities. This includes registering disabilities, recommending academic accommodations within the classroom, accessing special adaptive computer equipment, providing interpretation services and mediating faculty-student disability related issues. 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 when requesting accommodation

0001 Reid Hall, 352-392-8565, [www.dso.ufl.edu/drc/](http://www.dso.ufl.edu/drc/)