Course Syllabus

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Plant Genomics & Biochemistry (BOT 4530C / 5937)

Department of Biology, College of Sciences

4 Credit Hours

Instructor Information

- Instructor: Dr. Eric Goolsby
- Office Location: 402D (Biological Sciences)
- Office Hours: Tuesdays 5pm-7pm
- Digital Contact: Webcourses@UCF messaging.

Teaching Assistants

- GTA: Rebekah Davis
- Email: Webcourses@UCF messaging

Course Information

- Term: Fall 2022
- Course Number & Section: BOT 4530C / 5937
- Course Name: Plant Genomics & Biochemistry
- Credit Hours: 4
- Lecture: Tuesdays & Thursdays 10:00 AM - 11:15 AM
- Lab: Tuesdays 11:30 AM - 2:20 PM
- Class Location: 104 (Biological Sciences)
- Course Modality: P

Research-Intensive (RI) Course

The undergraduate section of this course (**BOT4530C**) is designated as a Research-Intensive (RI) course. This designation will be noted on your transcripts. Research-Intensive is one of the four High Impact Practice course designations at UCF, along with Service Learning, Integrative Learning, and Global Learning. High Impact Practice courses are some of the most challenging and rewarding at UCF. You will actively engage in research processes and a significant portion of your grade will be derived from course-related project(s) based on original research and/or creative scholarship.

Prerequisites

- Required: BOT 3015 (Principles of Plant Science) or permission of instructor
- Recommended: An introductory course in genetics (PCB 3063), ecology (PCB 3044), or evolutionary biology (PCB 4683)

Course Description

This course covers primary and secondary metabolic pathways in plants from a metabolomics and genomics perspective. It also highlights topics such as modern sequencing techniques and
applications (e.g., QTL analysis, genome-wide association studies, phylogenomics, transcriptomics, epigenomics, and phylogenetic comparative methods). The laboratory portion covers practical
skills and a research project throughout the semester integrating metabolomics and genomics. This course also covers foundational

git-based version control skills and introduces students to data analysis in R.

Course Materials and Resources

Required Materials/Resources

- Laptop required for lab (and occasionally for lectures)
- Textbook (**free** download): **Lessons on Caffeine, Cannabis, and Co: Plant-derived Drugs and their Interaction with Human Receptors**   **(https://link.springer.com/book/10.1007/978-3-319-99546-5)**

Student Learning Outcomes

- Understand major aspects of the structure and function of plant genomes.
- Think critically about the functional diversity of plant primary and secondary metabolism.
- Manipulate, inspect, and compare whole genome data using appropriate software.
- Generate research-grade plant biochemistry datasets using analytical chemistry approaches.
- Confidently perform common methods to analyze complex plant biochemical datasets.
- Create and interpret graphs and figures related to plant genomic and biochemical data.
- Select or design appropriate analytical approaches to address research questions.
- Understand basic experimental design and how research findings are disseminated.
- Think critically about the utility of genomic and biochemical data to plant breeding applications.
- Perform a systematic literature search to understand the primary literature on a given topic.
- Write a scientific article in appropriate format and style.
- Collaborate on projects using git/GitHub

Course Activities

- Assignments
- Midterm Exam (TBD late September or October)
- Final Exam: 10:00 AM – 12:50 PM (Tuesday, December 6, 2022)
- Laptop required in lab (and occasionally in lecture)
- Students are responsible for checking Webcourses at least twice weekly for assignments, announcements, and messages.

Activity Submissions

All assignments will be submited on-paper or via Webcourses@UCF (depending on instructions).

Attendance/Participation

- Attendance is expected for all lecture and lab sessions. You are responsible for submitting all assigned work by the deadline.
- Participation is required during paper discussions, lab, and all other class activities.
- If you are going to be absent, you must make arrangements with the instructor in advance to make up any missed work.
- If you have an unexpected absence, contact the instructor as soon as possible to make arrangements for any missed work.

According to the Undergraduate Catalog: "Reasons for acceptable absences may include illness, serious family emergencies, special curricular requirements (e.g., judging trips, field trips, professional conferences), military obligations, severe weather conditions, and religious holidays."

Make-up Exams and Assignments

Per university policy, you are allowed to submit make-up work (or an equivalent, alternate assignment) for authorized university-sponsored activities, religious observances, or legal obligations (such as jury duty). If this participation conflicts with your course assignments, I will offer a reasonable opportunity for you to complete missed assignments and/or exams. The make-up assignment and grading scale will be equivalent to the missed assignment and its grading scale. In the case of an authorized university activity, it is your responsibility to show me a signed copy of the Program Verification Form for which you will be absent, prior to the class in which the absence occurs. In any of these cases, please contact me ahead of time to notify me of upcoming needs.

Assessment and Grading Procedures

The table shows the weight distribution for each assignment.

Assignment	Percentage of Grade
Participation	10%
Assignments	30%
Research Project	40%
Midterm Exam	10%
Final Exam	10%
Total	100%

Grading Scale

Letter Grade	Points
A	90 – 100 points
A-	87.5 – 89.9 points
B+	85 – 87.4 points
B	80 – 84.9 points
B-	77.5 – 79.9 points
C+	75 – 77.4 points
C	70 – 74.9 points
C-	67.5 – 69.9 points
D+	65 – 67.4 points
D	60 – 65 points
D-	57.5 – 59.9 points
F	56.4 and below

Schedule and Important Dates

See home page for current course schedule.

- Midterm Exam: TBD late September or early October
- October 28: Withdrawal deadline
- November 8 (Election day / NO CLASS AND NO LAB **so you have time to vote!**)
- November 24 (Thanksgiving / no class)
- December 2: Final project due / last day of class
- December 6: Final Exam: 10:00 AM – 12:50 PM

University Services and Resources

Academic Services and Resources

A list of available academic support and learning services is available at **UCF Student Services** **(https://www.ucf.edu/services/)**. Click on "Academic Support and Learning Services" on the right-hand side to filter.

Non-Academic Services and Resources

A list of non-academic support and services is also available at **UCF Student Services** **(https://www.ucf.edu/services/)**. Click on "Support" on the right-hand side to filter.

If you are a UCF Online student, please consult the **UCF Online Student Guidelines** **(https://www.ucf.edu/online/resources /guidelines/)** for more information about your access to non-academic services.

Policy Statements

Academic Integrity

Students should familiarize themselves with UCF's **Rules of Conduct** **(https://scai.sdes.ucf.edu/student-rules-of-conduct/)**. According to Section 1, "Academic Misconduct," students are prohibited from engaging in:

- *Unauthorized assistance*: Using or attempting to use unauthorized materials, information or study aids in any academic exercise unless specifically authorized by the instructor of record. The unauthorized possession of examination or course-related material also constitutes cheating.
- *Communication to another through written, visual, electronic, or oral means*: The presentation of material which has not been studied or learned, but rather was obtained through someone else's efforts and used as part of an examination, course assignment, or project.
- *Commercial Use of Academic Material*: Selling of course material to another person, student, and/or uploading course material to a third-party vendor without authorization or without the express written permission of the university and the instructor. Course materials include but are not limited to class notes, Instructor's PowerPoints, course syllabi, tests, quizzes, labs, instruction sheets, homework, study guides, handouts, etc.
- *Falsifying or misrepresenting* the student's own academic work.
- *Plagiarism*: Using or appropriating another's work without any indication of the source, thereby attempting to convey the impression that such work is the student's own.
- *Multiple Submissions*: Submitting the same academic work for credit more than once without the express written permission of the instructor.
- *Helping another violate* academic behavior standards.

For more information about Academic Integrity, students may consult **The Center for Academic Integrity (https://academicintegrity.org/)**.

For more information about plagiarism and misuse of sources, see "**Defining and Avoiding Plagiarism: The WPA Statement on Best Practices** **(http://wpacouncil.org/node/9)**".

Responses to Academic Dishonesty, Plagiarism, or Cheating

Students should also familiarize themselves with the procedures for academic misconduct in UCF's student handbook, **The Golden Rule.** **(https://goldenrule.sdes.ucf.edu/wp-content/uploads/sites/64/2019/09/2019-2020-Golden-Rule.pdf)** UCF faculty members have a responsibility for students' education and the value of a UCF degree, and so seek to prevent unethical behavior and when necessary respond to academic misconduct. Penalties can include a failing grade in an assignment or in the course, suspension or expulsion from the university, and/or a "Z Designation" on a student's official transcript indicating academic dishonesty, where the final grade for this course will be preceded by the letter Z. For more information about the Z Designation, see **http://goldenrule.sdes.ucf.edu/zgrade** **(http://goldenrule.sdes.ucf.edu/zgrade)** .

Course Accessibility Statement

The University of Central Florida is committed to providing access and inclusion for all persons with disabilities. Students with disabilities who need disability-related access in this course should contact the professor as soon as possible. Students should also connect with **Student Accessibility Services** **(http://sas.sdes.ucf.edu/)** (Ferrell Commons 185, **sas@ucf.edu (mailto:sas@ucf.edu)** , phone (407) 823-2371). Through Student Accessibility Services, a Course Accessibility Letter may be created and sent to professors, which informs faculty of potential access and accommodations that might be reasonable. Determining reasonable access and accommodations requires consideration of the course design, course learning objectives and the individual academic and course barriers experienced by the student.

Campus Safety Statement

Though most emergency situations are primarily relevant to courses that meet in person, such incidents can also impact online students, either when they are on or near campus to participate in other courses or activities or when their course work is affected by off-campus emergencies. The following policies apply to courses in online modalities.

- To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to **https://my.ucf.edu (https://my.ucf.edu/)** and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- Students with special needs related to emergency situations should speak with their instructors outside of class.

Sections with face-to-face components (P, M, RV)

Emergencies on campus are rare, but if one should arise during class, everyone needs to work together. Students should be aware of their surroundings and familiar with some basic safety and security concepts.

- In case of an emergency, dial 911 for assistance.
- Every UCF classroom contains an emergency procedure guide posted on a wall near the door. Students should make a note of the guide's physical location and review the online version at **http://emergency.ucf.edu/emergency_guide.html (http://emergency.ucf.edu/emergency_guide.html)** .
- Students should know the evacuation routes from each of their classrooms and have a plan for finding safety in case of an emergency.
- If there is a medical emergency during class, students may need to access a first-aid kit or AED (Automated External Defibrillator). To learn where those are located, see the **AED Locations Page** **(https://ehs.ucf.edu/automated-external-defibrillator-aed-locations)** .
- To stay informed about emergency situations, students can sign up to receive UCF text alerts by going to **https://my.ucf.edu (https://my.ucf.edu/)** and logging in. Click on "Student Self Service" located on the left side of the screen in the toolbar, scroll down to the blue "Personal Information" heading on the Student Center screen, click on "UCF Alert", fill out the information, including e-mail address, cell phone number, and cell phone provider, click "Apply" to save the changes, and then click "OK."
- Students with special needs related to emergency situations should speak with their instructors outside of class.
- To learn about how to manage an active-shooter situation on campus or elsewhere, consider viewing this video **You CAN Survive an Active Shooter** **(https://youtu.be/NIKYajEx4pk)**

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(https://youtu.be/NIKYajEx4pk)

Deployed Active Duty Military Students

Students who are deployed active duty military and/or National Guard personnel and require accommodation should contact their instructors as soon as possible after the semester begins and/or after they receive notification of deployment to make related arrangements.

Copyright

This course may contain copyright protected materials such as audio or video clips, images, text materials, etc. These items are being used with regard to the Fair Use doctrine in order to enhance the learning environment. Please do not copy, duplicate, download or distribute these items. The use of these materials is strictly reserved for this online classroom environment and your use only. All copyright materials are credited to the copyright holder.

Third-Party Software and FERPA

During this course you might have the opportunity to use public online services and/or software applications sometimes called third-party software such as a blog or wiki. While some of these could be required assignments, you need not make any personally identifying information on a public site. Do not post or provide any private information about yourself or your classmates. Where appropriate you may use a pseudonym or nickname. Some written assignments posted publicly may require personal reflection/comments, but the assignments will not require you to disclose any personally identity-sensitive information. If you have any concerns about this, please contact your instructor.

Course Summary:

Date	Details	Due
Thu Aug 25, 2022	📝 **Discussion for Rieseberg et al (2022)** (https://webcourses.ucf.edu/courses/1418410 /assignments/7729676)	due by 10am
	📝 **R and RStudio first steps** (https://webcourses.ucf.edu/courses/1418410 /assignments/7737622)	due by 10am
	📝 **Reading / Questions for Rieseberg et al (2022)** (https://webcourses.ucf.edu/courses /1418410/assignments/7737595)	due by 10am
Thu Sep 1, 2022	📝 **Week 2 Lab (due 9/1)** (https://webcourses.ucf.edu/courses/1418410 /assignments/7730146)	due by 10am