PLP 2311: WHAT ARE PLANTS TALKING ABOUT?

Quest 2

I. General Information

Class Meetings

- T10:40 AM – 11:30 AM, R10:40 AM – 12:35 PM
- BLRB 154

Instructor

- Samuel Martins – (please use CANVAS message to communicate with me)
- Office: 2413 Fifield Hall; Box 110680
- Office hours: By appointment
- Phone: (352) 273-4649

Teaching Assistant (TBD)

- Name - email
- Office location: Fifield Hall
- Office hours: By appointment

This syllabus is subject to change by the instructor if needed.

Course Description

Plants are essential for the survival of most life forms on Earth as they provide us oxygen, wood, food, fiber, medicine and other resources. In the movie *The Martian*, one of the first approaches that Matt Damon took on the new planet was to engineer a way to grow potatoes to survive on the hostile planet. We tend to think of plants as passive organisms, but plants have been inhabiting this planet for hundreds of millions of years, way before us humans, and have developed sophisticated adaptation mechanisms to sense their environment and to cope with biotic and abiotic stresses. In the last decades surprising discoveries have been made in the plant science field, and there are still many more waiting to be made, as our society still faces challenges like hunger and malnutrition, desertification, soil erosion, pests and plant diseases. Moreover, emerging pathogens and pests are threatening our plants, killing trees and reducing crop yields. Are plants crying out for help and we can't hear? This and other intriguing and scientifically pressing questions will be addressed in this course through the lenses of how we can better understand plants and what we can do to mitigate the aforementioned issues, creating a better place to live and preserving our resources for future generations. This is a multi-disciplinary course within plant science and addresses topics about plant physiology, plant pathology, entomology, and microbiology.

Quest and General Education Credit

- Quest 2
- Biological Sciences

This course accomplishes the Quest and General Education objectives of the subject areas listed above. A minimum grade of C is required for Quest and General Education credit. Courses intended to satisfy Quest and General Education requirements cannot be taken S-U.

Required Readings and Works

What a Plant Knows: A Field Guide to the Senses by Daniel Chamovitz (2017). Additional readings will be distributed in class or added on the course site in Canvas.
Materials and Supplies Fees: n/a

II. Graded Work

Description of Graded Work

There will be 11 quizzes (9 required), 3 exams (two-stage style), 1 group assignment, 1 virtual exchange, 1 experiential learning assignment, 1 debate and self-reflection, 1 Kahoot (last week of class), 9 homework.

Quizzes: All quizzes will happen on Thursdays (3 to 6 questions each quiz), and each week students will alternate between responding to the instructor/TA questions and creating and answering their own questions (3 to 6 questions selected by the instructor/TA). For quiz 1 the instructor/TA will provide the questions, quiz 2 students will create the questions, quiz 3 the instructor will provide the questions, quiz 4 students will create the questions, and so forth. For the student-created quizzes, students will use a Google Doc to record their questions (**Link here**). Students are encouraged to bring a laptop, tablet, or smartphone to class every other Thursday when they are supposed to write the quiz questions in the Google Docs. If you don't have a laptop/ tablet or smartphone, that's fine too. Just communicate with me and we will find a solution.

Each student will create:

- 1 question based on the Tuesday class
- 1 question based on the Thursday class

Then, the instructor/TA will select 3 to 6 questions for the student quiz. We will go over all the quiz questions together immediately after the quiz. The TA will grade the quizzes later and add the grades to Canvas. In total, we will have 11 quizzes throughout the course, and the 2 quizzes with the lowest grades will be dropped. If you miss up to 2 quizzes it will not affect your quiz grades, *as you only need 9*.
If you miss *3 quizzes, all with justified reasons*, you are welcome to contact the instructor and TA for a make-up quiz. This is the only circumstance under which a make-up quiz will be given.

The goal of a desirable question for the quizzes:

- **Promote critical thinking**: requires you to analyze information and make connections.
- **Requires application**: use a concept to solve a problem or explain a scenario.
- **Connects to the real world**: grounds abstract concepts in tangible, relatable examples.
- **Encourages deeper understanding**: Moves beyond "what" to focus on "why" and "how."

Additionally:

- *If a question is multiple choice, it has to have at least four options.*
- *You can't create two questions about the same specific topic.*
- *True or false questions are only allowed if you make a false statement and ask why it is wrong and how to correct it.*

Exams: The exam questions will be 1/3 compiled from the questions the students create for the quizzes, and the remaining 2/3 will be new questions created by the instructor. Students will complete an individual copy of the exam questions alone first, which will account for 70% of their exam grade. Then, students will work together in small groups (3 people) to answer the same exam questions – each group will submit one set of answers that they will collaborate and agree on, and everyone in each group will receive the same score, which accounts for 30% of the exam grade.

During the second stage of the 2-stage exams students are required to take turns physically writing the answers. Everyone is expected to practice active listening and respect their peers' points of view in interpreting the question and results. Before starting the second stage of the exam, students should discuss how they will proceed in case of a disagreement on an answer. For example, one solution could be that the majority's opinion will be the final answer and in case of an even disagreement (eg. two members believe the correct answer is A and 2 other students think that the correct answer is B), the student who is holding the paper and pen/pencil will decide on the final response.
For the exam, you are welcome to bring a paperback or hardcover book (not related to the class subject and not textbooks) to read between stages 1 (individual part) and 2 (collaborative part) of the exam.

Experiential Learning

Searching for Signs of Plant Interactions: By the end of week 9, students are expected to be familiar with plant senses and some of the interactions (the good and bad ones) that plants have with the environment and other organisms.

Students will present their findings during class via PowerPoint and show the interaction that they identified (signs of plant responses or interactions with biotic and abiotic factors). Students will need to show a picture (*taken by the student*) of the plant and explain the plant's responses and/or interaction, location, and why the interaction is happening. Only one plant interaction between plant and other organisms/environment is expected to be explained. My expectation for the assignment is that you would use materials from class, including the book *What a Plant Knows*, but if you would also like to include outside sources you are welcome to. For the citations, you can use any style as long as it is used correctly.

This is an individual assignment and is worth a total of 5 points. To take the picture, submit it in Canvas and in Google doc, which is worth 1 point. The written part (min 200 words and max min 500 words) is worth 2 points and the presentation (~ 4 min long) is worth 2 points. The presentation will be during class and you will need upload your presentation to the class Google Drive folder a day before your presentation. As soon as you take your picture and know your plant interaction, be sure to write your name, date, and the interaction that you will be presenting in the Google Drive to avoid repetitive presentations. In case of repetitive topics, the student who filled out the form first will present. The other student needs to take another picture about another plant interaction. If the interaction is not already listed in the Google drive: https://drive.google.com/drive/u/0/folders/1Q02s8q0Yk2OKu5h4KDaJzfCp6ZzasMoj, students need to obtain approval from the instructor to present on that interaction.

Self-Reflection

Genetically modified food: Pros vs Cons

After debating in class about the use of biotechnological approaches to grow and manage plants, students will be asked to write a self-reflection essay about their point of view on the use of biotechnological approaches in agriculture (min 500 words; max 900 words). There is no right or wrong side. You won't be evaluated based on your point of view. The justifications and points you make will be assessed in the self-reflection.

Please submit your assignment individually via Canvas.

The self-reflection should cover at least the following points:

- Are you pro or anti GMOs?
- What is the main reason that makes you pro or anti GMO?
- Give a real example that justifies your perspective on this issue.
- Present at least 2 more reasons that make you pro or anti GMO and give examples.

- What are the possible consequences in the short and long term with or without GMOs, depending on the side you defend? If you are pro GMO you will talk about the consequences without it and vice-versa.

For the citations, you can use any style as long as it is used correctly.

Group Assignments

Group Assignment I: Plants Can Save the World!

A group of 4 students will identify a plant/tree that can be used to mitigate a problem that our society faces.

A few examples of problems that can be remediated by using plants are, but are not limited to:

- Plants used to control human or plant parasites (nematodes)
- Phytoremediation: the use of plants to remediate contaminated soils
- Plants that mitigate soil erosion
- Plants and human health (e.g. anxiety, Alzheimer, Parkinson's disease, etc.)
- Plants and air pollution mitigation
- Plant disease control with other plants
- Hidden hunger solved with plants
- Plants used to solve crimes
- The use of plants as biofuels (corn, sugarcane, other, if any)
- Others

Students are welcome to identify other environmental, agricultural, human, etc. issues and select a specific plant to develop their work. Once the plant and problem are identified, each group needs to send this information to the instructor/TA two weeks after the first day of class. A google doc was created (https://drive.google.com/drive/u/0/folders/1Q02s8q0Yk2OKu5h4KDaJzfCp6ZzasMoj), and each group is encouraged to take a look at the doc before choosing their plant and problem, to prevent topic overlap from happening.

Each group will have 8 to 13 min to present about their topic. In addition to the presentation, a written report (min 500 words; max 900 words using Times New Roman size 12 and 1" margins) should be submitted via Canvas. The following subtopics should be part of the written report and presentations:

- Contribution of each member of the group for the written part.*
- What is the problem that your group selected, and what impact does the problem have on our society?
- Are there methods used to mitigate the problem that you selected? If yes, is there any drawback about using these method(s)?
- Common name and scientific name of the plant that your group chose
- Origin and distribution of the plant
- Ideal conditions to grow it
- Include some special characteristics of the plant (e.g. it is used for decoration because of the beauty of the flower, the wood is highly valuable in the marketplace, etc.)
- How can the plant mitigate the problem that you selected? If possible, explain the mechanism
- How widely the plant is/can be used/applied.
- Is it economically viable to use the plant compared to other methods?

- What is your opinion about the use of the plant? Do you have an opinion on something that needs to be changed/improved?

* All members of the group are expected to help with the written part as well as present some part during the presentation. To ensure fair grading please include a short paragraph at the top of your assignment describing how each group member contributed to the final product. **Example:**
    - **Mary Jones:** Conducted research on the civilization (intro section), wrote 30% of the assignment (sections 1-3).
    - **John Smith:** Wrote 20% of the assignment (section 4), double checked the references, and submitted the final document.

The following rubric will be followed to assess the group assignment:

- *Written part:*
    - Were all subtopics present? Yes=100%; missing some=80%; less than half=50%
    - Is the written part less than 900 words and more than 500 words? Yes=100%; no=80%; more than 1800 or less than 250 words=50%
    - Is the text properly cited? Yes=100%; no=70%
- *Presentation part:*
    - Were all subtopics present? Yes=100%; missing some=80%; less than half=50%
    - Did the presentation fit within the time scheduled? Yes=100%; no=80%; double time=50%
    - Did everyone in the group present? Yes=100%; no=70%; just one person=50%

Group assignment Submission: Only one student from each group needs to submit the written assignment on behalf of the group via Canvas. Similarly, one student will need to upload their presentation to the Google Drive (it will be provided in Canvas) before class.

Group Assignment II: Virtual Exchange

SLOs:

- Identify potential career paths in plant pathology in an international setting
- Compare and contrast challenges and potential solutions related to growing plants in different parts of the world
- Practice professional communication

Students will form groups of 4, read the international researcher/professor's bio, and decide on who each group would like to interview. A list of international researchers/professors will be provided by the instructor. If more than one group chooses the same international researcher, the groups will decide by choosing a paper or draw popsicle stick. The group should designate the interviewer, note taker, time keeper, reporter in class, and email communicator. You can have more than one reporter, interviewer, etc if you wish. A students of each group will reach out to the international researcher/professor for a meeting via email. The email address is provided by the instructor. The students are going to write their own outreach emails. A few suggestions to help your group to set up the meetings are:

- make sure to send the first email early to give time for a response
- send a follow up email after 3 days if no response
- Be polite in your emails
- They are all doctors, therefore refer them as Dr. last name

- Introduce yourselves and be sure to mention my class and my name
- Ask for a specific date for the interview
- The meeting should be about 15 min. Make sure to mention that.
- Using online poll tools to set up the meeting is helpful (e.g. when2meet, doodle poll)
- Keep in mind the time zones when setting up the meeting.
- Copy me and the rest of the group in the email
- Don't send the questions up front
- Once the international researcher/professor replies, reply within 2 days thanking them and sending them the questions, so they can start thinking about the answers.
- Once the date is set, use Zoom or Teams to create a meeting.
- Before the meeting make sure you know how to properly use the technology for the interview (e.g. how to record, mute, etc).

During the interview:

- Introduce themselves first. (optional) you are encouraged to say a polite sentence in their native language (if their first language is not English).
- Ask any additional questions you didn't find online about their bio.
- Find out what the international researcher/professor's favorite plant is.
- Find out what were the reasons/motivation that led the international researcher/professor to their current position.
- Find out an example of a problem related to plants that they are going to or have worked on in the past, its importance, and what their findings are.
- Keep track of the timing during the interview so it doesn't go much over 15 minutes.
- *During the interview make sure your groups take the time to think about the answers provided and ask follow up questions if needed to ensure you understand the answer.*

Report to the class as a group:

- Report back on the questions you asked the international researcher/professor
- Each group will have 4 min to discuss their report to the class
- Report also any challenges faced
- What did you gain from this assignment?

Grading Scale

For information on how UF assigns grade points, visit: https://catalog.ufl.edu/UGRD/academic-regulations/grades-grading-policies/

A	94 – 100%		C	74 – 76%
A-	90 – 93%		C-	70 – 73%
B+	87 – 89%		D+	67 – 69%
B	84 – 86%		D	64 – 66%
B-	80 – 83%		D-	60 – 63%
C+	77 – 79%		E	<60

Grading Rubric(s)

List of Graded Work

Assignment	Description	Points
Quiz Scores	11 quizzes at 1.5 points each (n=16.5)*	13.5
Exam 1 Non-cumulative (1st third)	2-stage	18
Exam 2 Non-cumulative (2nd third)	2-stage	20
Exam 3 Non-cumulative (3rd third)	2-stage	20
Group assignment	In groups	9
Virtual Exchange (VE) assignment	Quiz (individually) + reflection (in groups)	7.5
Experiential learning	Individually	5
Debate and self-reflection	Individually	5
Kahoot**	Individually (last Kahoot only)	2
Total points*		**100**

*The two lowest quiz grades will be dropped, therefore, the maximum grade for the quizzes you can earn is 13.5.

Only the last Kahoot will be graded based on participation. The student needs to be present in class to receive the points. If you miss a quiz, this quiz will be automatically dropped (grade = 0). If you miss *3 quizzes, all with justified reasons*, you are welcome to contact the instructor and TA for a make-up quiz. ***This is the only circumstance under which a make-up quiz will be given.*

***A satisfactory grade will be earned with the equivalent of a "C-" grade or better (70-100 points). ***There will be no extra points, assignments, or rounding up for final grades*.** An exception is when the final grade difference to reach a whole number is ≤ 0.05%. Eg. 90.95% will be rounded up to 91. However, 90.94% will remain 90.94%.

Important note: For any assignment, if you submit it late, your score will be reduced by 0.5 points per day. For example, if you submit your assignment that is worth 10 points 2 days after the deadline, your submission will earn a maximum of 9 points. **Therefore, plan to submit your assignment early. No excuse can be made in case of technical/internet problems**. For the citations, you can use any style as long as it is used correctly.

This class is 100% in-person; therefore, students are expected to be physically present in the classroom. For most of the classes, we will have collaborative work and active learning activities. Therefore, absences should be reserved for justifiable reasons, such as illness or personal emergencies.

Below are the graded assignments, their due dates, and form of submission.

Due date	Assignment*	Format	Length	Submission	Points (%)
Jan 15th	Quiz 1 (Syllabus - questions provided by the instructor)	Individual	~15 min	In-class	1.5
Jan 15 to Feb 3rd	**Homework 1**: VE prep module I (What is VE?)	Individual	45 min	Canvas	N/A
Jan 15 to Feb 3rd	**Homework 2**: VE prep module II (Cultural self-awarness)	Individual	1 h 15 min	Canvas	N/A
Jan 15 to Feb 3rd	**Homework 3**: VE prep module III (Cultural factors)	Individual	55 min	Canvas	N/A
Jan 15 to Feb 3rd	**Homework 4**: VE prep module IV (Timing)	Individual	1 h 15 min	Canvas	N/A
Jan 22nd	Quiz 2 (questions created by the students)	Individual	~15 min	In-class	1.5
Feb 5th	VE Quiz	Individual	~15 min	In-class	3.5
Jan 29th	Quiz 3 (questions provided by the instructor)	Individual	~15 min	In-class	1.5
By Jan 29th	**Homework 5**: Define group for the Assignment Plants Can Save the World!	Individual	5 min	No submission needed	N/A
By Jan 29th	**Homework 6**: Define group of Group Assignment II: Virtual Exchange	Individual	5 min	No submission needed	N/A
Feb 3rd	Kahoot	Individual	15 min	In-class	N/A
Feb 5th	Exam 1	2-stages	2 h	In-class	18
By Feb 12th	**Homework 7**: First group meeting for the Plants Can Save the World! assignment	In groups	Group's Discretion	No submission needed	N/A
By Feb 12th	**Homework 8**: First group meeting for the Virtual Exchange assignment	In groups	Group's Discretion	No submission needed	N/A
Feb 12th	Quiz 4 (questions created by the students)	Individual	~15 min	In-class	1.5
Feb 19th	Quiz 5 (questions provided by the instructor)	Individual	~15 min	In-class	1.5
Feb 26th	Quiz 6 (questions created by the students)	Individual	~15 min	In-class	1.5
By Feb 26th	Group Assigment I: (Written Part) Plants Can Salve the World!	In groups	500 to 900 words	Canvas	5
Jan 30th to Mar 3rd	**Homework 9**: Meeting with International Researcher for the VE assignment	In groups	Group's Discretion	No submission needed	N/A
Mar 3rd	Kahoot	Individual	15 min	In-class	N/A
Mar 5th	Exam 2	2-stages	2 h	In-class	20
Mar 12th	Quiz 7 (questions provided by the instructor)	Individual	~15 min	In-class	1.5
Mar 12th	Group assignment I: (Presentation) Plants can Save the world!	In groups	8 to 13 min	In-class	4
By Mar 26th	Take the picture for the Experiential Learning	Individual	~5 min	Canvas & Enter info in Google Doc	1
Mar 26th	Quiz 8 (questions created by the students)	Individual	~15 min	In-class	1.5
Mar 31st	Experiential Learning (Written Part)	Individual	200 to 500 words	Canvas	2
April 2nd	Quiz 9 (questions provided by the instructor)	Individual	~15 min	In-class	1.5
April 2nd	Experiential Learning: Searching for Signs of Plant Interactions	Individual	~4 min	In-class	2
April 9th	Quiz 10 (questions created by the students)	Individual	~15 min	In-class	1.5
April 14th	Debate	Individual	15- 30 min	In-class	2
April 16th	Quiz 11 (questions provided by the instructor)	Individual	~15 min	In-class	1.5
Apr 16th	VE Reflection	In groups	~15 min	In-class	4
Apr 21st	Kahoot	Individual	15 min	In-class	2
Apr 21st	Self-reflection: Genetically modified food: Pros vs Cons	Individual	500 to 900 words	Canvas	3
Apr 28th	Exam 3	2-stages	2 h	12:30 - 2:30pm	20

*Read the syllabus for questions regarding any assignemnt

***Google Drive Link:**
https://drive.google.com/drive/u/0/folders/1Q02s8q0Yk2OKu5h4KDaJzfCp6ZzasMoj

III. Annotated Weekly Schedule

Week/ Date	Activity	Topic/Assignment (Question/Subject)
		MODULE I
Week 1	Topic	• Introductions • Course Overview • Why Do Plants Matter? Are Plants Aware?
	Summary	This first week you will get to know me (instructor and the TA) and your classmates and become familiar with the course structure. We will also discuss the importance of plants to our planet and learn how plants are acutely aware of the world around them.
	Readings/Works	Course Syllabus Why Humans Couldn't Exist Without Plants (1 page) Epilogue: The Aware Plant (from page 157 to 163). Charmovitz D, 2017.
Week 2	Topic	• Organic Molecules • DNA & Mutations: The Raw Material for New Features
	Summary	This week we will identify the types of organic molecules, their structural components and functions, which will help us to understand the signaling molecules that plants use to interact with their surroundings and communicate. We will talk about the impact of mutations on creating different types of cells, organisms, and populations, ranging for example from photosynthetic to carnivorous plants.
	Readings/Works	How are gene mutations involved in evolution? (1 page) Plants turn caterpillars into cannibals (2 pages) Science at FMNH - Early Land Plants (5:35 min video)
Week 3	Topic	• Research Search (Guest Lecture: Suzanne Stapleton) • The Plant Cell Structure • The Plant Structure

Week/ Date	Activity	Topic/Assignment (Question/Subject)
	Summary	This week we will learn at Marston Library how to do a research search, gaining hands-on experience guided by a librarian. We will also explore the inside of a plant cell and understand the cell components and their functions as well as different plant structures, some of them used in plant communication.
	Readings/Works	Plant Cell Structure (2 pages) Plants and Their Structures (4 pages)
Week 4	Topic	• Plant Signaling Molecules
	Summary	This week we will talk about the signaling molecules that plants use to interact with their surroundings and to communicate among themselves.
	Readings/Works	Plants Have Hormones, Too, and Tweaking Them Could Improve Food Supply (3 pages)
		MODULE II
Week 5	Topic	• Do Plants See? • Do Plants Smell?
	Summary	This week we will focus on talking about plant senses. We will start with sight and smell and discuss ways that plants communicate with one another and with other organisms from different kingdoms.
	Readings/Works	What a Plant Sees (pages 9 to 26). Chapter 1, Charmovitz D, 2017. What a Plant Smells (pages 27 to 48). Chapter 2, Charmovitz D, 2017. Climate Change May Make Plants More Fragrant (2 pages)
Week 6	Topic	• Do Plants Feel? • Do Plants Remember?
	Summary	This week we will talk about plant senses and will explain the ways that plants can remember by responding differently to the same event, including touch, that happened in the past.
	Readings/Works	What a Plant Feels (pages 69 to 90). Chapter 3, Charmovitz D, 2017. What a Plant Remembers (pages 135 to 156). Chapter 6, Charmovitz D, 2017. Plants Can Sense Animal Attacks Coming (2:34 min audio) Do Plants Think? (3 pages)

Week/ Date	Activity	Topic/Assignment (Question/Subject)
Week 7	Summary	This week students will present in groups (8 min each presentation) about a solution to a current problem by using a plant.
	Readings/Works	No Readings This Week
Week 8	Topic	• Do Plants Hear? • Do Plants Taste? • Proprioception: The Plant's 6th Sense
	Summary	This week we will look at plants' sense of hearing and learn how plants know where things are. We will examine the plant's response to gravity and look at some examples such as the sunflower, which daily responds to the sunlight.
	Readings/Works	What a Plant Hears (pages 91 to 112). Chapter 4, Charmovitz D, 2017. Do Plant Taste? (pages 49 to 68) Chapter 3, Charmovitz D, 2017. How Does a Plant Know Where It Is? (pages 91 to 113). Chapter 6, Charmovitz D, 2017. Plants May Let Out Ultrasonic Squeals When Stressed (2 pages)
		MODULE III
Week 9-10	Topic	• Plant Domestication & Plant Taxonomy • The Bad Interactions: Weeds (Guest Lecture: Carlene A. Chase) • The Bad Interactions: Plant Diseases
	Summary	Now that we have seen the plant senses, we will explore plants' interactions with the world around them. First, we will learn how plant domestication impacted the way plants interact with the environment (good and bad interactions) and the importance of classifying and giving names to plants (plant taxonomy). We also will talk about diseases and weeds, which are part of the bad interactions.
	Readings/Works	Where Did Agriculture Begin? Oh Boy, It's Complicated (2 pages) Monoculture Farming in Agriculture Industry (7 pages) The Plant Disease Doughnut, a Simple Graphic to Explain What is Disease and What is a Pathogen (2 pages) What are Weeds and Why do we Care? (2 pages) Hungry Planet: Stories of Plant Diseases (3 pages)
Week 11	Topic	• The Bad Interactions: Pests (Guest Lecture: Morgan Byron)

Week/ Date	Activity	Topic/Assignment (Question/Subject)
		• Experiential Learning Presentations: Signs of Plant Interactions
	Summary	This week we will finalize the bad interactions with talking about pests. Students will present their experiential learning assignments.
	Readings/Works	Plants Turn Caterpillars into Cannibals (2 pages)
Week 12	Topic	• The Good Interactions: Do Plants Cooperate Among Themselves? Plants and Beneficial Microbes • Plants and Soil Health (Guest Lecture: Dr. Yang Lin)
	Summary	This week we will look at the relationship between plants and beneficial microbes, such as bacteria and fungi, as well as viruses. We will explain where these microbials and viruses are found in the plant and what the benefits are for the plant to have them around. We will also see ways that plants cooperate with their neighbors. We will discuss the benefits that modern agricultural systems have brought us, but also some ecologically destructive impacts and other challenges that we currently face when dealing with plants in food production. We will go over the factors that make up healthy soil, which will help grow healthier and stronger plants.
	Readings/Works	Tiny Microbes, Big Yields: Enhancing Food Crop Production With Biological Solutions (3 pages) Healthy soil is the foundation of productive, sustainable agriculture (1 page & 2 min videos)
Week 13	Topic	• Plants and Pesticides • Plants, GMOs, CRISPR
	Summary	This week we will explore and debate on the use of biotechnological approaches used in agriculture, such as genetically modified organisms (GMOs) and clusters of regularly interspaced short palindromic repeats (CRISPR). Are they friends or foes? We will also discuss the impact that pesticides have had on agriculture.
	Readings/Works	Potential Health Effects of Pesticides (5 pages) GMOs – Top 3 Pros and Cons (2 pages) These Charts Show Every Genetically Modified Food People Already Eat in the U.S. (4 pages) The Food of the Future (51:44 min video) CRISPR in Agriculture: An Era of Food Evolution (6 pages)
Week 14	Topic	• Growing and Managing Plants with AI (Guest Lecture)

Week/ Date	Activity	Topic/Assignment (Question/Subject)
	Summary	This week we will discuss how artificial intelligence has transformed the way we grow and manage plants.
	Readings/Works	The Futuristic Farms That Will Feed the World (6:19 min video) Agriculture's Improving Image: Drones, satellites & data analysis drive a new agricultural revolution (2 pages)
Week 15	Topic	• Are Plants Crying out for Help? • Final Message
	Summary	In this final week we will go over the journey we have been on discussing the plant senses. We will identify the benefits and issues that the advent of agriculture brought us as well as the new technologies currently being used to mitigate the challenges we face while growing plants. We will discuss the evidence that plants have given that we need to change the course of our actions in order to preserve our planet.
	Readings/Works	New Research On Plant Intelligence May Forever Change How You Think About Plants (23:48 min audio) When plants cry out for help, their neighbors start screaming, too (2 pages) Are Giant Sequoia Trees Succumbing to Drought? (10 pages)

IV. Student Learning Outcomes (SLOs)

At the end of this course, students will be expected to have achieved the Quest and General Education learning outcomes as follows:

Content*: Students demonstrate competence in the terminology, concepts, theories and methodologies used within the discipline(s)*.

- Students will be able to identify, describe, and explain:
    - the importance of plants to our planet.
    - the similarities of human senses and plant senses.
- **(Quest 2 SLOs:** Identify, describe, and explain the cross-disciplinary dimensions of a pressing societal issue or challenge as represented by the social sciences and/or biophysical sciences incorporated into the course.)
- **Assessment:** Student competencies will be assessed through class participation, jigsaw activity, quizzes, and test 1

Critical Thinking: *Students carefully and logically analyze information from multiple perspectives and develop reasoned solutions to problems within the discipline(s).*

- Students will be able to analyze and evaluate:
    - how plants interact with their surroundings: the good and bad interactions.
    - the impact of monoculture on plant health and on the environment.
    - how we can better understand plants and what can we do to mitigate issues associated with plants (e.g. pests, diseases, pesticide overuse, soil erosion, etc.) in order to preserve our planet.
- **(Quest 2 SLOs:** Critically analyze quantitative or qualitative data appropriate for informing an approach, policy, or praxis that addresses some dimension of an important societal issue or challenge.)
- **Assessment:** Student competencies will be assessed through class participation, quizzes, test 2, and experiential learning

Communication: *Students communicate knowledge, ideas and reasoning clearly and effectively in written and oral forms appropriate to the discipline(s).*

- Students will be able to develop and present:
    - the importance of a selected plant in mitigating an important environmental issue.
    - solutions to the negative impact that modern forms of growing and managing plants have brought us.
    - parts of the course material in a cooperative learning style in a small group of students (3 to 4 students).
- **(Quest 2 SLOs:** Develop and present, in terms accessible to an educated public, clear and effective responses to proposed approaches, policies, or practices that address important societal issues or challenges.)
- **Assessment:** Student competencies will be assessed through class participation and group projects

Connection: *Students connect course content with meaningful critical reflection on their intellectual, personal, and professional development at UF and beyond.*

- Students will be able to connect course content with their own personal beliefs and behaviors regarding the pros and cons of modern technological approaches used to grow plants in our society.
- **(Quest 2 SLOs:** Connect course content with critical reflection on their intellectual, personal, and professional development at UF and beyond.)
- **Assessment:** Student competencies will be assessed through discussion (debate) and self-reflection

V. Required Policies

Attendance Policy

Requirements for class attendance and make-up exams, assignments, and other work in this course are consistent with university policies that can be found at: https://catalog.ufl.edu/ugrad/current/regulations/info/attendance.aspx

Students Requiring Accommodation

Students with disabilities who experience learning barriers and would like to request academic accommodations should connect with the disability Resource Center by visiting https://disability.ufl.edu/students/get-started/. It is important for students to share their accommodation letter with their instructor and discuss their access needs, as early as possible in the semester.

UF Evaluations Process

Students are expected to provide professional and respectful feedback on the quality of instruction in this course by completing course evaluations online. Students can complete evaluations in three ways:

- The email they receive from GatorEvals,
- Their Canvas course menu under GatorEvals, or
- The central portal at https://my-ufl.bluera.com

Guidance on how to provide constructive feedback is available at https://gatorevals.aa.ufl.edu/students/. Students will be notified when the evaluation period opens. Summaries of course evaluation results are available to students at https://gatorevals.aa.ufl.edu/public-results/.

University Honesty Policy

UF students are bound by The Honor Pledge which states, "We, the members of the University of Florida community, pledge to hold ourselves and our peers to the highest standards of honor and integrity by abiding by the Honor Code. On all work submitted for credit by students 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." The Honor Code (https://www.dso.ufl.edu/sccr/process/student-conduct-honor-code/) specifies a number of behaviors that are in violation of this code and the possible sanctions. Furthermore, you are obligated to report any

condition that facilitates academic misconduct to appropriate personnel. If you have any questions or concerns, please consult with the instructor or TAs in this class.

Counseling and Wellness Center

Contact information for the Counseling and Wellness Center: http://www.counseling.ufl.edu/ , 392-1575; and the University Police Department: 392-1111 or 9-1-1 for emergencies.

The Writing Studio

The writing studio is committed to helping University of Florida students meet their academic and professional goals by becoming better writers. Visit the writing studio online at http://writing.ufl.edu/writing-studio/ or in 2215 Turlington Hall for one-on-one consultations and workshops.

Use of AI for Written Assignments Only

It is crucial for you to ensure you understand the material and can independently apply critical thinking and analysis to the assignment. Language models/Chatbots, such as ChatGPT, can aid in exploring perspectives and refining arguments. If you decide to use language models for your written assignments be sure to verify the information provided, as the assignment will be evaluated based on your critical analysis and incorporation of the response generated by AI into your essay.

In-Class Recordings

Students are allowed to record video or audio of class lectures. However, the purposes for which these recordings may be used are strictly controlled. The only allowable purposes are (1) for personal educational use, (2) in connection with a complaint to the university, or (3) as evidence in, or in preparation for, a criminal or civil proceeding. All other purposes are prohibited. Specifically, students may not publish recorded lectures without the written consent of the instructor.

A “class lecture” is an educational presentation intended to inform or teach enrolled students about a particular subject, including any instructor-led discussions that form part of the presentation, and delivered by any instructor hired or appointed by the University, or by a guest instructor, as part of a University of Florida course. A class lecture does not include lab sessions, student presentations, clinical presentations such as patient history, academic exercises involving solely student participation, assessments (quizzes, tests, exams), field trips, private conversations between students in the class or between a student and the faculty or lecturer during a class session.

Publication without permission of the instructor is prohibited. To “publish” means to share, transmit, circulate, distribute, or provide access to a recording, regardless of format or medium, to another person (or persons), including but not limited to another student within the same class section. Additionally, a recording, or transcript of a recording, is considered published if it is posted on or uploaded to, in whole or in part, any media platform, including but not limited to social media, book, magazine, newspaper, leaflet, or third party note/tutoring services. A student who publishes a recording without written consent may be subject to a civil cause of action instituted by a person injured by the publication and/or discipline under UF Regulation 4.040 Student Honor Code and Student Conduct Code.

Important Research Note

As you probably know, some of your professors do research as part of their jobs. I am one of them. Toward that end, I would like to analyze your Virtual Exchange/Kahoot reflections and related assignments. What this means is I will:

1. transcribe the assignments and reflections that were turned in as a Word file with no names recorded (so I likely won't remember who said what).
2. read the Word file multiple times and code its content by themes to have a better idea of what worked and what didn't so I can improve my course over time.

I may present the findings at a conference and/or publish them in a journal, but neither presentations nor journal articles would include your names or any other identifiable information – not even the name of the course.

If you do not want your reflections and assignments to be included in this analysis, please let me know ASAP by email (sj.martins@ufl.edu).